Surfclam and Ocean Quahog Quota Specifications for 2011, 2012, and 2013
Including: Environmental Assessment, Regulatory Impact Review, and Initial Regulatory Flexibility Analysis

November 2010

Mid-Atlantic Fishery Management Council

in cooperation with the

National Marine Fisheries Service

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Last Revised: November 30, 2010

Executive Summary

This document provides a summary of relevant information for recommending quotas for surfclams (*Spisula solidissima*) and ocean quahogs (*Arctica islandica*) in federal waters for 2011, 2012, and 2013. Management responsibility for these two species resides with the Mid-Atlantic Fishery Management Council, based in Dover, Delaware. The management regime is detailed in the *Fishery Management Plan (FMP) for the Atlantic Surfclam and Ocean Quahog Fishery* (MAFMC 1977) and subsequent Amendments. Amendment 8 (MAFMC 1988) provided the most substantial change in the management regime through introduction of Individual Transferable Quotas (ITQs), which replaced a complex system of time and effort restrictions. Amendment 10 (MAFMC 1998) was approved by the National Oceanic and Atmospheric Administration (NOAA) in 1998, and provided more appropriate management measures for the small, artisanal fishery for ocean quahogs operating off of the northeast coast of Maine. Amendment 12 (MAFMC 1999) implemented a new overfishing definition for ocean quahogs, identified and described essential fish habitat for both species, implemented a framework adjustment process, and required Operator Permits. Amendment 13 (MAFMC 2003) was approved in 2004 and provided: a new surfclam overfishing definition, multi-year fishing quotas, a mandatory vessel monitoring system (VMS), when such a system was economically viable, the ability to suspend or adjust the surfclam minimum size limit through a framework adjustment, and an analysis of fishing gear impacts on Essential Fish Habitat (EFH) for surfclams and ocean quahogs. Framework Adjustment 1 (MAFMC 2006) was implemented in 2007 and provided for a mandatory vessel monitoring system. Amendment 14 is part of the Omnibus Amendment dealing with Annual Catch Limits (ACLs) and Accountability Measures (AMs). Amendment 15 is under development and will deal with a review of EFH and fishing gear impacts, new overfishing thresholds and targets for ocean quahogs, cost recovery, excessive shares and associated data collection.

The primary tool in the management of surfclams and ocean quahogs in federal waters is the specification of annual quotas, which are allocated to the holders of allocation shares at the beginning of each calendar year. With implementation of Amendment 13 (MAFMC 2003), the Council received the authority to recommend multi-year quotas to the Secretary of Commerce that will span the upcoming three years. In June of 2004, the Council recommended its first series of quotas for 2005, 2006, and 2007. The Secretary reviewed and ultimately accepted them. Staff continues to produce the annual quota recommendation papers and when there are no changes from the initial three year recommendations, there is no need for any Council activity (as was the case for all but the 2006 ocean quahog quota); however, when the Council decides to change its recommendations from the initial three year recommendations, the Council needs to recommend those specific changes to the Secretary. In June of 2007, the Council unanimously (17 in favor, 0 against, with the Regional Administrator abstaining) recommended its second set of three-year quotas for 2008, 2009, and 2010. In June of 2010, the Council nearly unanimously (12 in favor, 1 against, with the Regional Administrator abstaining) recommended its third set of three-year quotas for 2011, 2012, and 2013.

Table 1. Quota Specifications for 2005, 2006, and 2007.			
Year	2005	2006	2007
Surfclams	3.400 mil. bu.	3.400 mil. bu.	3.400 mil. bu.
Ocean Quahogs	5.333 mil. bu.	5.333 mil. bu.	5.333 mil. bu.
Maine Ocean Quahogs	100,000 ME bu.	100,000 ME bu.	100,000 ME bu.

Table 2. Quota Specifications for 2008, 2009, and 2010.			
Year	2008	2009	2010
Surfclams	3.400 mil. bu.	3.400 mil. bu.	3.400 mil. bu.
Ocean Quahogs	5.333 mil. bu.	5.333 mil. bu.	5.333 mil. bu.
Maine Ocean Quahogs	100,000 ME bu.	100,000 ME bu.	100,000 ME bu.

Table 3. Quota Recommendations for 2011, 2012, and 2013.			
Year	2011	2012	2013
Surfclams	3.400 mil. bu.	3.400 mil. bu.	3.400 mil. bu.
Ocean Quahogs	5.333 mil. bu.	5.333 mil. bu.	5.333 mil. bu.
Maine Ocean Quahogs	100,000 ME bu.	100,000 ME bu.	100,000 ME bu.

This document summarizes information currently available as of mid-2010 and will be used as a basis for evaluating quotas for 2011, 2012, and 2013.

Surfclam Life History and Distribution

Surfclams are bivalve mollusks which are distributed in the western North Atlantic from the southern Gulf of St. Lawrence to Cape Hatteras. Commercial fisheries have generally concentrated on the populations of surfclams which have flourished in the high-energy, sandy ocean sediments off the coast of New Jersey and the Delmarva peninsula. Growth rates are relatively rapid, with clams reaching the preferred harvest size (approximately 5 inches) in about six years. Maximum size is about 9 inches in length, though individuals larger than 8 inches are rare. They have a longevity of approximately 35 years, and while some individuals reach sexual maturity within three months, most spawn by the end of their second year.

In the mid-Atlantic region, surfclams are found in the relatively shallow waters from the beach zone to a depth of about 150 feet. Substantial fisheries have been present in the 3-mile jurisdictions of the States of New Jersey and New York.

Traditionally, surfclams' dominant use has been in the "strip market" to produce fried clams. In recent years, however, they have increasingly been used in chopped or ground form for other products, such as high-quality soups and chowders.

Surfclam Stock Status

The Atlantic surfclam stock in the US EEZ is not overfished and overfishing is not occurring (USDC 2009b and Appendix 3). Estimated fishable stock biomass in 2008 (survey year, 4.75 inch shell length) was 1.93 billion pounds of meats which is above the management target of ½ the 1999 biomass level of 1.19 billion pounds of meats (Table 4). Estimated fishing mortality in 2008 was 0.027, which is below the management threshold of 0.15. These SAW estimates are for the entire EEZ stock, including the portion of the EEZ stock on Georges Bank (GBK) that is not currently available because of Paralytic Shellfish Poison (PSP).

The most important development in the surfclam resource over the past several years has been the dramatic reduction in biomass evident in the New Jersey inshore area, and off the coast of the Delmarva peninsula. The loss of the biomass in the southern end of the species range was identified in the 2003 SARC and was the impetus for a NEFSC and industry sponsored research effort in the summer of 2004 (USDC 2005). This joint survey (only on the portion of the surfclam resource south of Hudson Canyon) documented the large decline in the portion of the resource off of Delmarva (DMV) but found more biomass off northern New Jersey (NNJ) than was estimated from the 2002 NEFSC survey. In fact, the 2004 survey indicated that the biomass level in NNJ was similar to what was found there by the 1997 and 1999 surveys. Strong recruitment occurred in the late 1990s in the two NNJ mid-depth strata, but not in shallower strata of NNJ or DMV (USDC 2005).

Recruitment has been below average since 1999 (USDC 2009b). The last strong year classes on GBK, NJ, and DMV occurred in 1999, 1992, and 1993 respectively. The full assessment report describes factors that may have reduced recent recruitments in the DMV and NJ regions.

The surfclam stock biomass is declining from record-high levels during the late 1990s toward lower levels similar to the early 1980s. High biomass during the late 1990s was due to relatively high recruitment and relatively fast growth rates in the southern region in the past. Fishable biomass in 2008 was 1.93 billion pounds of meats, which has declined about 3% per year since the late 1990s.

The decline in surfclam biomass since the late 1990s can be explained by negative surplus production caused by lower recruitment and slower growth rates in the NJ and DMV regions. The fishery appears to have been a secondary factor. When surplus production is negative, stock biomass will decline, even when no fishing occurs. When fishing occurs, stock biomass will decline whenever catch exceeds surplus production.

Table 4. Surfclam and Ocean Quahog Reference Points, Basis, and Estimated Values based on 2009 Stock Assessments.

Reference Point	Basis	Estimated Value
Surfclams		
Biomass Target	½ Current (1999) Biomass (proxy for B_{MSY})	1.19 billion pounds
Biomass Threshold	½ Proxy for B_{MSY}	599 million pounds
2008 Biomass		1.93 billion pounds
Fishing Mortality Target	$F_{target} < F_{threshold}$	Set by Council selected quota
Fishing Mortality Threshold	F = M	0.15
Current F		0.027
Ocean Quahogs		
Biomass Target	½ Virgin Biomass	3.94 billion pounds
Biomass Threshold	¼ Virgin Biomass	1.97 billion pounds
2008 Biomass		6.41 billion pounds
Fishing Mortality Target	$F_{0.1}$	0.028
Fishing Mortality Threshold	$F_{25\%MSP}$	0.052
Amend. 15 Biomass Threshold (proposed)	40% Virgin Biomass	3.16 billion pounds
Amend. 15 Fishing Target (proposed)	$F_{target} < F_{threshold}$	Set by Council selected quota
Amend. 15 Fishing Threshold (proposed)	$F_{45\%MSP}$	0.022
Current F, exploited areas		0.010

Regions with the highest fishable biomass shifted from the south to the north during 1982-2008 (USDC 2009b). During 1982, Delmarva held the largest fraction of fishable surfclam biomass. The fraction of total biomass in Delmarva increased through the late-1980s and then declined to the current relatively low level. New Jersey held the largest share of surfclam biomass during 1994-2002. During 2008, the largest share of surfclam biomass was in the GBK area due to declining biomass in DMV and NJ. This has been a huge change where in 1986 DMV and SVA had 55% of the biomass and now in 2008 only has 5% while GBK in 1986 had 5% and now has 48%. New Jersey has maintained its share of the biomass in that it had 32% in 1986 and 22 years later it still has 30%.

The surfclam stock assessment (USDC 2009b) produces projections and provides decision table analyses. Biological reference points for biomass and fishing mortality were required by the Sustainable Fisheries Act (SFA) of 1996 and proposed by the Council in 1999 under Amendment 12 (MAFMC 1999). The 1999 reference points for biomass were rejected by the Agency because they were for the New Jersey portion of the resource only. New and approved biomass reference targets and thresholds for the entire surfclam resource were the focus of Amendment 13 (MAFMC 2003).

This quota recommendation paper is for 2011, 2012 and 2013 only. Amendment 13 allowed the Council to set multi-year quotas for three years based on a new survey and assessment every three years. It was initially anticipated that with the *RV Delaware II* being decommissioned soon, there would need to be a move of the survey to an industry platform. Initially, that could have delayed the completion of a new assessment in 2012. The plan now is to conduct one more clam survey in 2011 on the *Delaware II* and maintain the three-year schedule. MAFMC staff was anticipating a potential delay and requested five year projections during the stock assessment and that is why projections are run through 2015 rather than simply three years through 2013.

Forecast results (USDC 2009b) indicate that surfclam biomass will continue to decline slowly through 2015. In all cases, this occurs because surplus production has been negative and is likely to remain negative due to poor recruitment and slow growth in the more southern regions.

Fishing mortality at the proxy for MSY times the current biomass would yield a catch of 251.3 million pounds of meats (14.8 million bushels). Surfclams were overfished in the mid 1970s (prior to management) when 75 to 90 million pounds of meats were landed for a couple of years. The Council has a specified OY range in the FMP (since the early 1980s) of 31.5 to 57.8 million pounds (1.85 to 3.4 million bushels). A plan Amendment would be required to change this OY range.

The probability of overfishing and overfished status for this stock appears low under all of the states of nature considered (USDC 2009b Table A1). Projections for decision table analysis included three values for natural mortality (low (0.1), medium (0.15), and high (0.2) levels); and three survey dredge catchabilities as "states of nature".

Industry Under Stress Leads to Increased Consolidation

The past several years have been extremely difficult for the East Coast clam industry. As will be discussed in greater detail in the following sections, in 2005 a 'perfect storm' of conditions combined to result in a substantial portion of the industrial fleet leaving the clam fishery and greatly reduced operations at the second-largest processor in the clam industry. Eastern Shore Seafood Products of Mappsville, Virginia was a vertically-integrated company operating both vessels and a processing plant. In 2005, a deal was struck in which ownership of the plant and vessels were given over to an entity including the Truex, Meyers, Truex Group, and the Sea Watch management team. In May of 2008 the Mappsville plant ceased operations altogether, and moved the processing work to other Sea Watch plants in Easton, Maryland and Milford, Delaware (Vaughn 2008).

A myriad of factors have contributed to the difficulties in the clam industry. Major users of clam meats have reduced their purchases from industry and stopped advertizing products like clam chowder in the media. Industry members reported that imported meat from Canada and Vietnam

contributed to an oversupply of clam meats in the marketplace. The costs to vessels harvesting clams has increased due to the rising costs of fuel and insurance. Trips harvesting surfclams have increased in length as catch rates have declined.

All of these factors and more have resulted in clam-related businesses becoming less profitable in recent years. By 2008 the industry had experienced layoffs and shed 22% of the industrial fleet. In 2004, there were 50 vessels participating in the surfclam and ocean quahog fisheries apart from Maine. In 2009, there were 43 vessels operating in the surfclam fishery. Consolidation and concentration in the industry has grown as the businesses in the strongest financial condition assimilate those in the weakest position.

The Federal Surfclam Fishery

- In 2009, the industry reported harvesting a total of 2.594 million bushels of surfclams based on vessel logbook reports, a decrease of 11.2% from the prior year. Contributing factors likely include the soaring price of fuel in recent years, the economic downturn, and falling catch rates.

- Industry has experienced difficulty utilizing increases in both the federal surfclam and ocean quahog quotas that were implemented in 2004. In 2009 the unharvested portion of the surfclam quota equaled 24% of the 3.4 million bushel total.

- The most worrisome trend in the surfclam fishery continues to be the decline in the productivity of effort. The average number of bushels harvested in an hour of fishing is an important indicator of both the abundance of clams in the beds being fished, as well as the costs of fishing operations. Increases in fishing time from working on sparser beds translates directly into higher fuel costs.

- A fleet-wide calculation of surfclam Landings Per Unit of Effort (LPUE) has declined by an average of almost 10% <u>each year</u> between 2000 and 2009, from 129 to 52 bushels per hour (Appendix Table 1 and Appendix Figure 1). Appendix Figure 1 illustrates the decline as almost a straight line.

- The increased costs associated with longer fishing trips are magnified by the fuel price increases of the past several years. Industry members have mentioned that clam vessels operating hydraulic dredges have the additional expense of supplying fuel to the dredge pump engine.

- The need to maintain product freshness places an upper bound on how long vessels may remain at sea. In 2009 the average trip took 34.8 hours dock-to-dock; an increase of 6.4% over the prior year.

- The average ex-vessel price of a bushel of surfclams increased $0.06 to $11.97 in 2009. Price competition among purchasers may have lessened somewhat with the consolidation occurring in the industry, and reported ex-vessel prices may have less meaning from vertically-integrated firms that own both vessels and processing plants. Prices ranged from a low of $10.50 per bushel to a high of $18.50 for premium, high-yielding clams. Most trips were reported within a narrower range of $10.50 - $13.50 per bushel.

Table 5. Federal Surfclam and Ocean Quahog Quotas and Landings: 1979 - 2010.

Surfclams (Thousand Bushels)				Ocean Quahogs (Thousand Bushels)			
* Georges Bank first closed for PSP in 1990				* Maine ocean quahog fishery excluded 1991 - 2010			
Year	**Landings**	**Quota**	**% Harvested**	**Year**	**Landings**	**Quota**	**% Harvested**
1979	1,674	1,800	93%	1979	3,035	3,000	101%
1980	1,924	1,825	105%	1980	2,962	3,500	85%
1981	1,976	1,825	108%	1981	2,888	4,000	72%
1982	2,003	2,400	83%	1982	3,241	4,000	81%
1983	2,412	2,450	98%	1983	3,216	4,000	80%
1984	2,967	2,750	108%	1984	3,963	4,000	99%
1985	2,909	3,150	92%	1985	4,570	4,900	93%
1986	3,181	3,225	99%	1986	4,167	6,000	69%
1987	2,820	3,120	90%	1987	4,743	6,000	79%
1988	3,032	3,385	90%	1988	4,469	6,000	74%
1989	2,838	3,266	87%	1989	4,930	5,200	95%
1990*	3,114	2,850	109%	1990	4,622	5,300	87%
1991	2,673	2,850	94%	1991*	4,840	5,300	91%
1992	2,812	2,850	99%	1992*	4,939	5,300	93%
1993	2,835	2,850	99%	1993*	4,812	5,400	89%
1994	2,847	2,850	100%	1994*	4,611	5,400	85%
1995	2,545	2,565	99%	1995*	4,628	4,900	94%
1996	2,569	2,565	100%	1996*	4,391	4,450	99%
1997	2,414	2,565	94%	1997*	4,279	4,317	99%
1998	2,365	2,565	92%	1998*	3,897	4,000	97%
1999	2,538	2,565	99%	1999*	3,770	4,500	84%
2000	2,561	2,565	100%	2000*	3,161	4,500	70%
2001	2,855	2,850	100%	2001*	3,691	4,500	82%
2002	3,113	3,135	99%	2002*	3,871	4,500	86%
2003	3,244	3,250	100%	2003*	4,069	4,500	90%
2004	3,138	3,400	92%	2004*	3,823	5,000	77%
2005	2,744	3,400	81%	2005*	2,940	5,333	55%
2006	3,057	3,400	90%	2006*	3,066	5,333	57%
2007	3,231	3,400	95%	2007*	3,366	5,333	63%
2008	2,920	3,400	86%	2008*	3,426	5,333	64%
2009	2,594	3,400	76%	2009*	3,434	5,333	64%
2010	n/a	3,400	---	2010*	n/a	**5,333**	---

Source: NMFS Clam Vessel Logbook Reports, Woods Hole, MA

- The total ex-vessel value of the 2009 federal harvest was approximately $30.0 million, down 14.6% from 2008. [Note that price and value statistics presented in this document are those reported by industry processors and dealers. Prior documents relied on values reported by vessels.]

- Unlike the ocean quahog fishery, the surfclam fishery has been unable to find large, dense beds of high-yield surfclams to replace those that have been the mainstay of the fleet for many years. The high catch rates that were reported off eastern Nantucket Island have dropped substantially from the 200+ bushels per hour experienced when the dense beds were first discovered in 2004. The industry continues to depend most heavily on a single degree square off New Jersey: 3973. It supplied 55% of the 2009 federal harvest, down from 57% in 2008. (Appendix Table 3). Average catch rates in that square declined 9% in 2009, from 59 to 54 bushels per hour.

- A modest fishery for surfclams does persist at the southern end of its range, in the deeper waters off the coast of Maryland and Virginia. Degree square 3874 supplied 10% of the 2009 harvest at approximately 260,000 bushels (Appendix Table 3).

Ocean Quahog Life History and Distribution

Ocean quahogs are found in the colder, deeper waters of the shelf on both sides of the North Atlantic. Off the United States and Canada, they range from Newfoundland to Cape Hatteras at depths from 25 feet to 750 feet. As one progresses northward, ocean quahogs inhabit waters closer to shore, such that the State of Maine has a small commercial fishery which includes beds within the state's territorial sea, however these beds are as deep as 300 feet.

Ocean quahogs are one of the longest-living, slowest growing marine bivalves in the world. Under normal circumstances, they live to more than 100 years old. Ocean quahogs have been aged in excess of 200 years. They require roughly twenty years to grow to the sizes currently harvested by the industry (approximately 3 inches) and reach sexual maturity between ages 5 and 15.

Ocean Quahog Stock Status (Excluding Maine)

The ocean quahog stock in the US EEZ is not overfished and overfishing is not occurring (USDC 2009a and Appendix 4). Estimated fishable stock biomass during 2008 (survey year) was 6.4 billion pounds of meats, which is above the management target of ½ the virgin (1978 pre-fishery) biomass level of 3.9 billion pounds of meats (Table 4). Estimated fishing mortality during 2008 for the exploited region (all areas except GBK) was 0.010, which is significantly below the current approved management threshold of 0.05 (MAFMC 1999) and still less than half the SARC (USDC 2009a) recommended and Council approved definition proposed for Amendment 15 that is under development. These estimates for ocean quahogs in the US EEZ do not include Maine waters, which were assessed separately (see below). However, biomass and landings for Maine waters are minor and would have no appreciable effect on estimates for the whole stock (USDC 2009a).

Mean annual recruitment to the whole stock was small (less than 1% per year). A pulse of recruitment in Long Island has finished growing to fishable size, based on survey data collected during 2008. Survey size frequency data in 2008 indicate an increasing number of pre-recruits in parts of Southern New England and GBK. Recruitment of these individuals to the fishable stock is expected to occur over the next decade.

The fishable stock biomass in 2008 was 6.4 billion pounds of meats (USDC 2009a). Estimated virgin biomass in 1978 was 7.9 billion pounds of meats. The ocean quahog population is a relatively unproductive stock that is being fished down from its virgin state towards the B_{msy} reference point. After several decades of relatively low fishing mortality, the stock is still at 81% of the pre-fishing level.

Based on NEFSC survey data, LPUE data and biomass estimates for 1977-2008, declines in stock biomass are most pronounced in southern regions. In particular, stock biomass is below the one-half virgin level in the Southern Virginia, Delmarva, and New Jersey regions (USDC 2009a).

An increasingly large fraction of the stock (84% during 2008 compared to 67% during 1978) now occurs in the northern regions (Long Island, Southern New England, and Georges Bank). The GBK region is of particular importance because it contained 33% of total biomass in 1978 and 45% of total biomass in 2008. Georges Bank has been closed to fishing since 1990 because of PSP, but may be opened to fishing later this summer (see PSP discussion).

The SARC summary (USDC 2009a) produces projections and provides decision table analyses. Biological reference points for biomass and fishing mortality were required by the SFA of 1996 and proposed by the Council in 1999 under Amendment 12 (MAFMC 1999) and approved by the Secretary (Table 4). New, more conservative biological reference points were recommended by the 2009 SARC for biomass threshold, fishing mortality threshold, and fishing mortality target (Table 4). These proposed reference points were endorsed by the FMAT in August 2009 and approved by the Council (October 2009) for inclusion in Amendment 15.

Based on a review of F_{MSY} reference points of long-lived West Coast groundfish species the 2009 SARC recommended $F_{threshold}$ is $F_{45\%} = 0.0219$. The new SARC recommended biomass threshold of 3.2 billion pounds of meats is 40% of the 1978 pre-fishery biomass. This recommended biomass threshold is *ad hoc*, but it is probably better than the current biomass reference point both in relation to $F_{45\%}$ and in maintaining a productive stock for the long term (USDC 2009a).

This quota recommendation paper is for 2011, 2012 and 2013 only. Amendment 13 allowed the Council to set multi-year quotas for three years based on a new survey and assessment every three years. It was initially anticipated that with the *RV Delaware II* being decommissioned soon, there would need to be a move of the survey to an industry platform. Initially, that could have delayed the completion of a new assessment in 2012. The plan now is to conduct one more clam survey in 2011 on the *Delaware II* and maintain the three year schedule. MAFMC staff was anticipating a potential delay and requested five year projections during the stock assessment and that is why projections are run through 2015 rather than simply three years through 2013.

Projection results indicate that overfished (low biomass) stock conditions are not likely to occur by 2015 under any of the states of nature or management policies considered in projections. Overfishing (F too high) is unlikely to occur in 2015 at status-quo or at the current FMP OY minimum (USDC 2009a). However, there is some probability of overfishing in 2015 for landings

as high as the current quota or the maximum OY allowed by the FMP if the F is calculated for just the "exploited" stock. Under Amendment 12 (MAFMC 1999) it was argued that the fishing mortality reference points should be compared to only the proportion of the stock that is exploitable and not the biomass that is not available due to area closures (i.e., GBK). The Regional Office had recently developed an Environmental Assessment and published a proposed rule (75 *Federal Register* 37745; June 30, 2010) for opening GBK to fishing for the first time in two decades. Should GBK be available to fishing, the entire biomass will then be used as a comparison for the reference points which will bring in the 45% of the resource that is on GBK. There is then no probability of overfishing for the entire stock even at the maximum level of 6.000 million bushels allowed by the FMP.

The $F_{45\%}$ recommended new threshold times the current biomass would yield a catch of 140.5 million pounds of meats (14.0 million bushels; USDC 2009a Table B1). Ocean quahogs have never been overfished since the inception of the fishery in the late 1970s. The Council has a specified OY range in the FMP (since the early 1980s) of 40.0 to 60.0 million pounds (4 to 6 million bushels). A plan Amendment would be required to change this OY range.

The probability of overfishing and overfished status for this stock appears low under all of the range of catches allowed by the FMP and states of nature considered (USDC 2009a Table B27). Projections for decision table analysis included three values for natural mortality (low (0.015), medium (0.020) and high (0.025) levels).

The Federal Ocean Quahog Fishery

- Landings of ocean quahogs totaled 3.434 million bushels in 2009 based on vessel logbook reports, an increase of only 0.2% over 2008. The 2005 harvest of 2.940 million bushels was the lowest level experienced in the past 24 years. The ocean quahog fishery has been affected by the same market forces that reduced the harvests of surfclams, however the impact was more severe because their value is roughly half that of surfclams.

- Landings had been on a declining trend from 1992 to the year 2000, when the harvest of ocean quahogs was at its lowest level in two decades. Fully 30% of the 2000 federal quota was left unharvested, as declining catch rates and higher fuel prices had reduced the profitability of harvesting ocean quahogs.

- In 2001, new life was breathed into the ocean quahog fishery, sparked by a sharp increase in ex-vessel prices and the improved efficiency of large, newly constructed vessels. Landings jumped approximately 17%, followed by a 5% increase in both 2002 and 2003.

- In 2004, the ocean quahog fishery started into another decline. As mentioned previously, industry elected to reduce production of the lower-valued ocean quahogs first, and followed with surfclam production cutbacks only when it became clear there was no other choice.

- In 2005 the impacts of the crisis were most strongly felt. The federal quota had been newly increased to 5.333 million bushels, however at year's end, 45% had been left unharvested. This was the largest percentage surplus on record.

- A total of 15 vessels participated in the ocean quahog fishery in 2009, a decrease of three vessels from 2008, and far below the 29 vessels that participated in 2004. The consolidation

of the fishery into fewer hands is evident when one notes that just 4 large vessels accounted for over 50% of the federal ocean quahog harvest in each of the past several years.

- Of the 5.333 million bushel quota for 2009, 4,540 bushels were leased to the Maine fishery, and 3.434 million harvested by the industrial fishery outside of Maine.

- The average ex-vessel price of ocean quahogs reported by processors increased a modest 2.3% from $6.61 to $6.76 per bushel in 2009. Prices ranged from a low of $6.00 to a high of $8.50 per bushel, with the vast majority reported at either $6.50 or $7.00. A large portion of the increase was due to the skyrocketing price of diesel fuel in recent years. The total ex-vessel value of the 2009 federal harvest outside of Maine was approximately $23.0 million or <1% decrease from the prior year.

- Fleet performance statistics suggest that production continues to shift to large vessels fishing longer trips. For example, the average number of ocean quahog trips taken per vessel in 2008 declined from 75 to 66 trips. However the average number of hours reported fishing on each trip increased over 10%, from 19 hours to 21. The average amount harvested per trip increased from approximately 83 cages to 88. (Each cage holds 32 bushels.)

- A fleet-wide calculation of LPUE showed that the average number of bushels harvested per hour of fishing increased from 135 in 2008 to 141 in 2009 (Appendix Table 2). In early 2010 the average increased to almost 144 again, though this may be reflecting the fact that only the larger vessels would be able to fish the dense offshore beds in the winter months of January and February (Appendix Figure 2).

- Examination of ocean quahog LPUE over the past 20 years looks something like a roller coaster ride, with many peaks and valleys (Appendix Figure 2). Each 'hill' illustrates the pattern of improving productivity as the fleet moves to a new area of virgin biomass, and each valley the decline in productivity as that area is fished down.

- Harvests of ocean quahogs remained concentrated on the high-yielding degree square off eastern Long Island (4072). Fully 74% of the coastwide harvest was taken from this square in 2006. In 2008 and 2009, the percentage had decreased to 68 and 45% of the total harvest, respectively. The next most heavily fished areas are the adjacent squares to the east (4071) and southwest off New Jersey (3973) - (Appendix Table 4 and Appendix Figure 4).

- Obtaining the highest catch rate can require traveling a substantial distance offshore, as evidenced by the darkest-colored squares on a map of ocean quahog catch rates by ten-minute square (Appendix Figure 4). Limits on further movement of the fleet to the east were imposed by the closure of surfclam and ocean quahog beds east of the 69° line since 1990, due to the presence of PSP toxin.

- Some fishing for ocean quahogs does persist in the southern waters off Delmarva (squares 3873 and 3874), though catch rates are generally between 50 to 100 bushels per hour (Appendix Table 4).

The Maine Ocean Quahog Resource and Fishery

Landings, surveys carried out by the State of Maine, and survey dredge efficiency estimates were

used to estimate biomass and fishing mortality of ocean quahogs in Maine waters during 2005 through 2008. The estimates for Maine apply only to the area surveyed, which includes the primary fishing ground.

In 2005 and 2008, Maine conducted its own stock assessment, complete with dredge efficiency estimates, which was peer-reviewed as part of the ocean quahog SARC (USDC 2009a). The majority of the following two paragraphs come from that peer-review.

There are two principal fishing grounds for ocean quahogs in Maine waters, the east bed and the west bed, which together cover about 60 nautical square miles. Landing peaked in 2002 at nearly 129,000 bushels and then declined in the following years until rebounding in 2006 (Appendix Table 2). The most productive eastern fishing grounds were reopened by the State of Maine in late 2005 after three years of closure due to PSP contamination.

Fishing effort in Maine waters peaked during 2004 at about 19,000 hours per year and then declined to about 10,000 hours in 2009. Ocean quahogs harvested from Maine waters are small in size compared to those harvested in the EEZ. Ocean quahogs in the Maine fishery range from 1.4 to 2.8 inches, and are marketed in the fresh and half-shell market at relatively high prices.

The small-scale fishery for ocean quahogs in Maine provides a stark contrast to the industrial fishery that occurs off the coast of the mid-Atlantic States up through Massachusetts. Small vessels in the 35-45 ft range actively target smaller ocean quahogs for the fresh, half shell market in Maine. Most of the catch is trucked directly out of Maine and brings an ex-vessel price that ranges from $24 - $40 per Maine bushel.

Fishable biomass in Maine waters in 2005 was estimated to be 36.5 million pounds or 3.3 million Maine bushels. The Maine fishery is small, relative to the rest of the EEZ, and unique. In particular, the Maine fishery exploits relatively small ocean quahogs at a rate where F = 0.02. That fishing mortality is more than double that on the remainder of the exploitable stock.

In 2009 the Maine ocean quahog fleet harvested a total of 55,649 Maine bushels, a 17% decrease from the 66,964 bushels harvested in 2008 (Appendix Table 2). Of the total 2009 harvest, 51,109 bushels were taken from the 100,000 bushel quota for Maine, and 4,540 bushels were leased from the industrial ITQ fishery to the south. Average catch rates have declined from a recent peak of 8.1 bushels per hour in 2006 to 5.7 bushels in 2009. In early 2010 the average increased to over 6 bushels per hour.

Finally, average prices have declined substantially over the past five years. In 2003, there were very few trips that sold for less than $37.00 per Maine bushel, and the mean price was $40.66. Aggressive price cutting by one company has driven prices down such that many trips in 2008 and 2009 sold for $28.00, with the mean price for all trips equaling $33.31 per bushel in 2008. With fuel prices soaring in mid-2008, the number of vessels participating in the fishery fell to a total of 22 vessels. In 2009, the mean price was $32.91 per Maine bushel and a total of 19 vessels participated in the fishery; the lowest level of vessels on record in the current data series extending back to 1991.

The value of the 2009 harvest reported by the purchasing dealers totaled approximately $2.0 million, a drop of 15% from the prior year.

The Maine ocean quahog quota has been 100,000 bushels since implementation of Amendment 10 in 1999.

Paralytic Shellfish Poisoning

During nearly every summer since the Council began managing the Maine ocean quahog resource (1999), some of the principal fishing grounds in Maine have been closed due to the presence of PSP. These closures have been important in preventing the quotas from being exceeded because they generally occur when the demand for the resource is highest. The eastern-most beds between Petit Manan Point and Long Point were reopened in October 2005 (Stockwell pers com) for the first time in three years and contributed greatly to the recent increase in LPUE. The commercially active Maine beds were sufficiently free of PSP to remain completely open for all of 2006 and in August 2007 there was one short PSP closure that had minimal impact on the fishery. In both 2008 and 2009, there were significant closures due to PSP in Maine waters (Couture pers comm).

Contamination from PSP has also had a huge impact on the fledgling fisheries for surfclams and ocean quahogs on GBK. These resources were initially closed in 1990 when PSP was found and have remained closed. This area has continued to increase its relative percentage of the biomass for each species and now comprises over 45% of both surfclam and ocean quahog total EEZ biomass. The amount of resources on Georges Bank is very important, as LPUE for surfclams continues to decline in the areas to the west and south of GBK. Both industry and government have been trying to figure a way that these GBK resources can be safely harvested in the future.

The National Ocean Service (NOS) has provided a grant to the Food and Drug Administration (FDA), the States of Maine, New Hampshire, and Massachusetts as well as a clam industry representative to collect water and shellfish samples from federal waters off of southern New England, Gulf of Maine, and Georges Bank. This multi-year project monitors *Alexandrium spp* cell counts in the water column and PSP levels in shellfish along the New England coast and on GBK. Research vessels collect water samples, along with fish and shellfish taken from the ocean floor. A clam vessel collects water and shellfish samples from Nantucket Shoals, Stellwagen Bank, and Georges Bank. The FDA designed the sampling protocol and defined the locations where shellfish samples will be taken.

The FDA's shellfish PSP Protocol has been revised from its original 1995 requirements to incorporate the latest scientific understanding and technology. The FDA and the Interstate Shellfish Sanitation Commission have ratified the Protocol to be tested in a pilot project. The pilot project was implemented in the spring of 2008. The data from both projects will be used to monitor and better understand the spread of PSP in New England waters.

As of mid-July 2010, the Regional Office of NMFS had develop a Programmatic Environmental Assessment for the reopening of the GBK fisheries for surfclams and ocean quahogs. A proposed rule for reopening a portion of GBK had been published in the *Federal Register* (75 FR 37745; June 30, 2010) with a 30 day comment period. After review of the comments, it is possible that the Cultivator Shoal area of GBK could be reopened in mid to late-summer, depending on whether or not a large *Alexandrium* bloom occurred prior to any proposed openings. *Alexandrium* blooms generally occur in May through July.

Key Aspects of the Surfclam and Ocean Quahog Fisheries

There are a number of important aspects of the surfclam and ocean quahog fisheries that distinguish them from most other fisheries in the US, and around the world. In many ways, participants in the clam fisheries are fortunate in their ability to conduct their business operations efficiently and profitably, without many of the complications and liabilities experienced by most other fisheries.

- **Single Species Fisheries with No Significant Bycatch** Industry is able to harvest both surfclams and ocean quahogs individually, with no significant bycatch of any other species. This greatly simplifies management and reduces the need for gear restrictions to reduce the harvest of non-target species (Wallace and Hoff 2004).

- **No Interactions with Protected Species** The hydraulic dredge is not known to have any impacts on marine mammals, turtles, seabirds or other species protected by law.

- **No Significant Gear Conflicts** There have been no reports of gear conflicts in federal waters between clam fishermen utilizing hydraulic dredges and other types of fishing gear, whether mobile or stationary (Wallace and Hoff 2005).

- **Impacts to Essential Fish Habitat (EFH) are Minimal and Temporary** The prime habitat of surfclams and ocean quahogs consists of sandy substrates with no vegetation or benthic 'structures' that could be damaged by the passing of a hydraulic dredge. In these 'high energy' environments, it is thought that the recovery time following passage of a clam dredge is relatively short. Additionally, the overall area impacted by the clam fisheries is relatively small (approximately 100 square nautical miles), compared to the large area of high energy sand on the continental shelf. Any impacts to EFH are considered temporary and minimal (Wallace and Hoff 2005).

- **No Recreational Fisheries** There are no recreational fisheries for either Atlantic surfclams or ocean quahogs. Management efforts focus solely on commercial harvests (Hoff 2006).

- **ITQ Management Promotes Efficiency and Profitability** Managing surfclams and ocean quahogs with tradeable shares of the annual quota has provided industry with greater flexibility and removed incentives for derby fishing. Vessel owners can readily plan to harvest their quota at any time throughout the year. Supply disruptions are eliminated when fishermen are no longer faced with closures imposed to prevent a seasonal, group quota from being exceeded. Profitability and efficiency are dramatically enhanced when unneeded vessels can be sold out of a fishery that has adopted ITQ management. Effort management systems which tie harvest rights to individual vessels make it difficult for excess capital to find more productive uses elsewhere in an economy (Wallace *et al* 2005).

- **Reduced Enforcement Costs** A number of benefits were realized in the area of enforcement following the transition to ITQ management in 1990. Major cost savings resulted when enforcement activity shifted from watching vessels at sea with expensive Coast Guard cutters and aircraft to monitoring clam transportation containers on land. Incentives for cheating were drastically reduced once allocation holders were faced with the prospect of forfeiting the allocation itself for repeated violations. Additionally, the improved efficiency

derived from ITQ management has improved the profitability of the clam industry as a whole. Consequently, is it less likely that industry members will feel compelled to break the law due to financial stress in their business operations (Hoff 2006).

Quota Specifications

Table 6. Alternatives for 2011, 2012, and 2013 ITQ Fisheries.

Surfclams				
	Description	2011 Quota (bu)	2012 Quota (bu)	2013 Quota (bu)
Alt. S1	Min. Allowable	1.850 million	1.850 million	1.850 million
Alt. S2	Slight Decrease	3.250 million	3.250 million	3.250 million
Alt. S3**	Status Quo	3.400 million	3.400 million	3.400 million
Alt. S4	No Action (Quota Removed)	Unlimited	Unlimited	Unlimited
Ocean Quahogs				
	Description	2011 Quota (bu)	2012 Quota (bu)	2013 Quota (bu)
Alt. Q1	Min. Allowable	4.000 million	4.000 million	4.000 million
Alt. Q2	Slight Decrease	5.000 million	5.000 million	5.000 million
Alt. Q3**	Status Quo	5.333 million	5.333 million	5.333 million
Alt. Q4	Max. Allowable	6.000 million	6.000 million	6.000 million
Alt. Q5	No Action (Quota removed)	Unlimited	Unlimited	Unlimited

** Recommendation

Table 7. Alternatives for 2011, 2012, and 2013 Maine Ocean Quahog Fishery.

	Description	2011 Quota	2012 Quota	2013 Quota
Alt. M1	50% of Max. Quota	50,000 Maine Bu.	50,000 Maine Bu.	50,000 Maine Bu.
Alt. M2	Slight Decrease	90,000 Maine Bu.	90,000 Maine Bu.	90,000 Maine Bu.
Alt. M3**	Max Allowable - Status Quo	100,000 Maine Bu.	100,000 Maine Bu.	100,000 Maine Bu.
Alt. M4	No Action (Quota removed)	Unlimited	Unlimited	Unlimited

** Recommendation

Surfclam ITQ Quota Recommendation for 2011, 2012, and 2013: 3.400 million bushels

The Council identified four alternative quotas for the years 2011, 2012, and 2013. Since the 2010 quota of 3.400 million bushels is the maximum OY (optimum yield) and the maximum allowable under the FMP, the two alternatives which would decrease the quota correspond to the minimum allowed under the FMP and the 2003 quota of 3.250 million bushels. The Council voted nearly unanimously (with one opposed and the RA abstaining) to recommend maintaining 3.400 million bushels for the following reasons.

The picture we have of the surfclam resource and fishery is complex and has elements that can and do change annually. Yet the bottom line is that the best scientific advice we currently have indicates that maintaining the annual quota at the maximum OY level of 3.4 million bushels is sustainable (USDC 2009b). The most recent biological assessment indicates that the resource is composed of many age classes, is not overfished, and overfishing is not occurring.

The Council's SSC met on May 11 and reviewed surfclams and ocean quahogs (Boreman 2010, Appendix 5). The SSC recommended an ABC equal to the catch at 0.75% * the overfishing level* the current biomass. This calculation produced an ABC of 96,600 metric tons (approximately 213 million pounds or 12.5 million bushels). Obviously, this ABC is significantly above the maximum OY allowed in the FMP, indicating that the Council quota recommendations are conservative.

There are a number of factors that argue for a cautious approach in the management of surfclams in the future. The most important of these includes the steady decline in fleet LPUE that has accompanied the large, sustained harvests off New Jersey. Additionally, the lack of surfclam recruitment in the warmer inshore waters of New Jersey strongly suggests that future harvests from that resource area will likely be reduced.

Additionally, there was an industry sponsored survey in cooperation with the NEFSC in the summer of 2004 (USDC 2005). The focus of this survey was the New Jersey and the Delmarva stock assessment areas and not the entire range of the resource. The reason for this southern focus is the hypothesis that global warming is affecting the surfclam resource on its southern and inshore boundaries. This issue alone may warrant changes in the multi-year quotas as the resource is assessed in the future.

Finally, the greatest "wild card" in the recommendations is the status of the GBK resource. Closed since 1990 due to the presence of PSP, the resource there should effectively be in a near virgin state. The proposed rule to open the Cultivator Shoal portion of GBK that was published in the *Federal Register* (75 FR 37745; June 30, 2010) is currently open for comment and if and when Cultivator Shoal opens to fishing, a significant amount of concern will be reduced.

Ocean Quahog ITQ Quota Recommendation for 2011, 2012, and 2013: 5.333 million bushels

The Council identified five alternative ocean quahog quotas and voted nearly unanimously (with one opposed and the RA abstaining) to recommend maintaining 5.333 million bushels (Alternative Q3), with steady quotas for the next three years. As with the recommendation for

surfclams, the primary reason for maintaining the status quo is that the best scientific advice (USDC 2009a) available to the Council indicates that this constant quota is sustainable. The ocean quahog resource is not overfished and overfishing is not occurring.

The Council's SSC met on May 11 and reviewed surfclams and ocean quahogs (Boreman 2010, Appendix 5). The SSC recommended an ABC equal to the catch at 0.75% * the overfishing level* the current biomass in the exploited area. This calculation produced an ABC of 26,100 metric tons for the non-GBK portion of the resource (approximately 58 million pounds or 5.8 million bushels). Obviously, this ABC is above the recommended quota, indicating that the Council quota recommendations are conservative.

The Council believes that the life history of ocean quahogs warrants a particularly conservative approach in its management but that this quota is sustainable (USDC 2009a). As will be discussed in other sections, ocean quahogs are one of the longest-living, slowest growing marine bivalves in the world. Under normal circumstances, they live to more than 100 years old, with many having been aged at over 200 years.

Research indicates that vast quantities of ocean quahogs remain in the ocean, in spite of decades of harvests that have removed many of the densest concentrations. A question that has vexed managers for years is at what point the remaining ocean quahog resources might become uneconomical to harvest, given the lower value they have historically commanded in the marketplace. Recent price increases and the deployment of efficient new vessels have served to allay these concerns.

An additional reason for maintaining the status quo is in response to the continued reduction of the surfclam quota in New Jersey state waters. This reduction has been severe, and the Council wishes to consider supporting continued access to ocean quahogs in an effort to maintain current supplies of clam meats as the industry adjusts to the change.

Finally, the greatest "wild card" in the recommendations is the status of the GBK resource. Closed since 1990 due to the presence of PSP, the resource there should be in great shape. The proposed rule to open the Cultivator Shoal portion of GBK that was published in the *Federal Register* (75 FR 37745; June 30, 2010) is currently open for comment and if and when Cultivator Shoal opens to fishing, a significant amount of concern will be reduced.

Maine Ocean Quahog Quota Recommendation for 2011, 2012, and 2013: 100,000 Bu.

The Mid-Atlantic Council recommends that the Maine ocean quahog quota remain unchanged for the next three years at the initial maximum quota level of 100,000 Maine bushels (1 bushel = 1.2445 cubic feet). This quota pertains to the zone of both state and federal waters off the eastern coast of Maine north of 43° $50'$ north latitude. Amendment 10 established management measures for this small artisanal fishery for ocean quahogs and was implemented in 1998.

Maine conducted a survey and assessment of the ocean quahog resource off Maine, and the maximum quota level appears sustainable (USDC 2009a). It is anticipated that some Maine fishermen will rent ITQ allocation after the 100,000 bushel quota is reached.

Surfclam Size Limit Suspension

The Mid-Atlantic Council is recommending that the minimum size limit on surfclams be suspended again for the next three years, as it has been since implementation of Amendment 8 (MAFMC 1988). The Regional Administrator's staff evaluates the biological sampling data on an annual basis to ensure that less than 30% of the samples are undersized. The 2009 analysis of biological sampling data indicate that only 6.1% of the surfclam landings were smaller than 4.75" (Witzig 2009). Current assessment (USDC 2009b) information indicates that the stock is composed of nearly all age groups and primarily of larger, adult clams in most areas. Reinstating a minimum size under these conditions would result in greater harm than benefit, as it would require the industry to use "sorting" machines which often damage/destroy undersized clams as it routes them back overboard.

2.0 LIST OF ACRONYMS

ABC	Allowable Biological Catch
AFS	American Fisheries Society
B	Biomass
CEA	Cumulative Effects Analysis
CEQ	Council on Environmental Quality
CZM	Coastal Zone Management
DMV	Delmarva Stock Assessment Region
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Fishing Mortality Rate
FMP	Fishery Management Plan
GB	Georges Bank Stock Assessment Region
IRFA	Initial Regulatory Flexibility Analysis
ITQ	Individual Transferrable Quota
LI	Long Island Stock Assessment Region
LPUE	Landings Per Unit Effort
M	Natural Mortality Rate
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MSP	Maximum Spawning Potential
MSY	Maximum Sustainable Yield
mt	metric tons
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NJ	New Jersey Stock Assessment Region
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NAO	National Oceanic and Atmospheric Administration Administrative Order
OY	Optimal Yield
PRA	Paperwork Reduction Act
PREE	Preliminary Regulatory Economic Evaluation
PSP	Paralytic Shellfish Poisoning
RA	Regional Administrator
RIR	Regulatory Impact Review
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SNE	Southern New England stock assessment region
SFA	Sustainable Fisheries Act
SSB	Spawning Stock Biomass
SVA	Southern Virginia Stock Assessment Region
VECs	Valuable Environmental Components
VTR	Vessel Trip Report

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Appendix 3 Atlantic Surfclam Advisory Report – 2009.

Appendix 4 Ocean Quahog Advisory Report – 2009.

Appendix 5 SSC Report – Memo from John Boreman to Richard Robins.

Appendix 6 May 26, 2010 Letter from Terry Stockwell to Richard Robins.

4.0 INTRODUCTION AND BACKGROUND OF SPECIFICATION PROCESS

4.1 Introduction and Purpose and Need for the Action

The purpose of this action is to implement 2011, 2012, and 2013 commercial management measures for the surfclam and ocean quahog fisheries. The need of implementing these commercial management measures is to ensure that the Atlantic surfclam and ocean quahog resources are conserved and not overfished in accordance with the Fishery Management Plan and the National Standards of the Magnuson Act.

This document provides a summary of relevant information for recommending quotas for surfclams (*Spisula solidissima*) and ocean quahogs (*Arctica islandica*) in federal waters for 2011, 2012, and 2013. Management responsibility for these two species resides with the Mid-Atlantic Fishery Management Council, based in Dover, Delaware. The management regime is detailed in the *Fishery Management Plan (FMP) for the Atlantic Surfclam and Ocean Quahog Fishery* (MAFMC 1977), and subsequent Amendments to the Plan (MAFMC 1979a, 1979b, 1981, 1984, 1986, 1987, 1988, 1996, 1998, 1999, and 2003). Amendment 8 (MAFMC 1988) provided the most substantial change in the management regime through introduction of Individual Transferable Quotas (ITQs), which replaced a complex system of time and effort restrictions. Amendment 10 (MAFMC 1998) was approved by the National Oceanic and Atmospheric Administration (NOAA) in May 1998, and provided more appropriate management measures for the small, artisanal fishery for ocean quahogs operating off of the northeast coast of Maine. Amendment 12 (MAFMC 1999) was partially approved in April 1999 and implemented a new overfishing definition for ocean quahogs, identified and described essential fish habitat for both species, implemented a framework adjustment process, and required Operator Permits. Amendment 13 (MAFMC 2003) was implemented in January 2004. Amendment 13 was designed to address the disapproved surfclam overfishing definition, the disapproved fishing gear impacts to essential fish habitat (EFH) discussion, allow for multi-year quotas, allow for a vessel monitoring system (VMS) and add to the list of framework measures the suspension of the surfclam minimum size limit and adjustment of the minimum size. Framework 1 implemented VMS in the fisheries (MAFMC 2006). Amendment 14 is part of the Omnibus Amendment dealing with Annual Catch Limits (ACLs) and Accountability Measures (AMs). Amendment 15 is under development and will deal with a review of EFH and fishing gear impacts, new overfishing thresholds and targets for ocean quahogs, cost recovery, excessive shares and associated data collection.

The primary tool in the management of surfclams and ocean quahogs in federal waters is the review and specification of quotas, which are allocated to the holders of allocation shares at the beginning of each calendar year. This document provides a summary of the most recent information available concerning the biological status of these natural resources, and the commercial fisheries which utilize them. Several alternative quota scenarios for each species are proposed and evaluated.

Regulations implementing the FMP (50 CFR 648) provide that the Secretary of Commerce (Secretary) will specify the quotas. Based upon the Council's recommendation, the Regional Administrator may propose surfclam and or ocean quahog quotas that differ from the annual quotas specified for the current 3-year period. The OY range for surfclams is between 1,850,000 bushels and 3,400,000 bushels. The OY for ocean quahogs is between 4,000,000 bushels and 6,000,000 bushels. The quota range for the Maine ocean quahog area (both state and federal

waters off the eastern coast of Maine north of 43° 50' north latitude) is between 17,000 bushels and 100,000 bushels.

Beginning in 2005, the amount of surfclams or ocean quahogs that may be caught annually by fishing vessels subject to these regulations will be specified for a three-year period by the Regional Administrator on or about December 1 (50 CFR 648.71(a)). The initial 3-year specification was based on the 2002 survey and associated stock assessments for Atlantic surfclams and ocean quahogs. The second three-year specification was based on the 2005 survey and the associated 2007 stock assessments for Atlantic surfclams and ocean quahogs. The third three-year specification is based on the 2008 survey and the associated 2009 stock assessments. Subsequent three-year specifications of the annual quotas will be accomplished on or about December 1 of the third year of the quota period, unless the quotas are modified in the interim. On an annual basis, MAFMC staff will produce an Atlantic surfclam and ocean quahog annual quota recommendation paper to the MAFMC based on the latest available stock assessment report prepared by NMFS, data reported by harvesters and processors, and other relevant data, as well as the information identified below. In selecting the quotas the Council must consider current stock assessments, catch reports, and other relevant information concerning: exploitable and spawning biomass relative to the optimum yield; fishing mortality rates relative to the optimum yield; magnitude of incoming recruitment; projected effort and corresponding catches; geographical distribution of the catch relative to the geographical distribution of the resource; and status of areas previously closed to surfclam or ocean quahog fishing that are to be opened during the year.

The quota is set at that amount which is most consistent with the objectives of Amendment 8 of the Fishery Management Plan for the Atlantic Surfclam and Ocean Quahog Fishery (MAFMC 1988). The Secretary may set quotas at quantities different from the Council's recommendations only if he can demonstrate that the Council's recommendations violate the National Standards of the Magnuson Act and the objectives of the Atlantic Surfclam and Ocean Quahog Fishery Management Plan.

The following table presents surfclam and ocean quahog quotas since 1990 and the 2011, 2012, and 2013 recommendation voted by the Mid-Atlantic Fishery Management Council at their June 2010 Council meeting:

Table 8. Surfclam and Ocean Quahog Past Quotas and Future Recommendations Since Implementation of the ITQ Program in 1990.

	Surfclams (million bushels)	Ocean Quahogs (million bushels)
1990 Quota	2.850	5.300
1991 Quota	2.850	5.300
1992 Quota	2.850	5.300
1993 Quota	2.850	5.400
1994 Quota	2.850	5.400
1995 Quota	2.565	4.900
1996 Quota	2.565	4.450
1997 Quota	2.565	4.317
1998 Quota	2.565	4.000
1999 Quota	2.565	4.500
2000 Quota	2.565	4.500
2001 Quota	2.850	4.500
2002 Quota	3.135	4.500
2003 Quota	3.250	4.500
2004 Quota	3.400	5.000
2005 Quota	3.400	5.333
2006 Quota	3.400	5.333
2007 Quota	3.400	5.333
2008 Quota	3.400	5.333
2009 Quota	3.400	5.333
2010 Quota	3.400	5.333
2011 Recommendation	**3.400**	**5.333**
2012 Recommendation	**3.400**	**5.333**
2013 Recommendation	**3.400**	**5.333**

4.2 Management Objectives and Management Unit of the FMP

The objectives of the FMP, since implementation of Amendment 8, have been and continue as:

1. Conserve and rebuild Atlantic surfclam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.

2. Simplify to the maximum extent the regulatory requirement of surfclam and ocean quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of surfclam and ocean quahog management.

3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of surfclam and ocean quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.

4. Provide a management regime and regulatory framework that is flexible and adaptive to unanticipated short term events or circumstances, and consistent with overall plan objectives and long term industry planning and investment needs.

The management unit is all Atlantic surfclams (*Spisula solidissima*) and ocean quahogs (*Arctica islandica*) in the Atlantic EEZ. In 1988, the American Malacological Union officially changed the common name of "surf clam" to the one word name "surfclam." This was published in the American Fisheries Society (AFS) special publication 16 entitled *Common and Scientific Names of Aquatic Invertebrates from the United States and Canada: Mollusks* (AFS 1988). The ocean quahogs managed in this FMP include a small-scale fishery in eastern Maine that harvests small ocean quahogs which are generally sold for the half-shell market. Locally these small ocean quahogs off the coast of Maine are known as "mahogany quahogs" and have been under Council management since implementation of Amendment 10 (MAFMC 1998). There is no scientific question that the small scale Maine fishery occurs on *Arctica islandica.*

5.0 MANAGEMENT ALTERNATIVES BEING CONSIDERED

5.1 Surfclam *(Spisula solidissima)* Quota

5.1.1 Preferred Alternative (S3) - 3.400 Million Bu. (Status Quo)

The Council's preferred alternative quota for the next three years for the surfclam fishery is 3.400 million bushels, which is the same as the 2004 through 2010 quotas. This preferred alternative is based on the 2009 SAW (USDC 2009b and Appendix 3) which indicates the surfclams are not overfished and overfishing is not occurring.

The five most recent biological assessments (from the 1997, 1999, 2002, 2005, and 2008 surveys) indicate the resource is healthy, composed of many age classes, and can safely maintain these maximum OY levels of harvests. The F in 2008 associated with a quota of 3.400 million bushels was approximately 0.03, and these same quotas may result in an F in 2011, 2012, and 2013 of about 0.04, which is well below the overfishing definition.

The Council supports the Regional Office's publication of a proposed rule (75 *Federal Register* 37745; June 30, 2010) that would allow the opening of Cultivators Shoal on GBK to clam fishing as long as the US FDA continues certifying the healthfulness of the resources harvested there. The GBK area has been closed to the harvest of clams and other shellfish since 1990. If the area can be opened to fishing, nearly half the known EEZ biomass will become available.

5.1.2 Alternative S1 - 1.850 Million Bu.

The first non-preferred alternative quota for the 2011, 2012, and 2013 surfclam fishery is 1.850 million bushels. This quota is the minimum of the OY range as required by the FMP.

The 1.850 million bushel alternative represents nearly a 50% decline from the 3.400 million bushel quota that had been implemented in 2004. The direct impact would be that surfclam allocation owners would each receive only about half the cage tags that they had in 2004 through 2010. All allocation owners would be affected proportionally the same, since the harvest right which each individual entity owns is actually a percentage share of the annual quota. If all other aspects of the surfclam fishery were to remain constant, such as ex-vessel prices and the quantity of surfclams supplied from state waters, then the major human consequence of the quota reduction is the near-term decrease in revenues, which occurs from postponing a portion of the harvest of surfclams to a later year. It is unlikely, however, that all the other conditions that held true previously will pertain again for the next three years. Reducing the quota for the next three years could possibly affect the long-term growth of the industry, if industry is correct and the total demand for both species of clams is growing.

5.1.3 Alternative S2 - 3.250 Million Bu.

The second non-preferred alternative quota for 2011, 2012, and 2013 surfclam fishery is the 2003 quota of 3.250 million bushels. This quota is within the OY range of between 1.850 and 3.400 million bushels as required by the FMP. This alternative would reduce the surfclam quota to the level it was in 2003. This 5% decrease in quota (from 2004 through 2010 levels) could be constraining on the industry.

The direct impact would be that surfclam allocation owners would each receive about 5% less cage tags than they had in 2004 through 2010. All allocation owners would be affected proportionally (5%) the same, since the harvest right which each individual entity owns is actually a percentage share of the annual quota. If all other aspects of the surfclam fishery were to remain constant, such as ex-vessel prices and the quantity of surfclams supplied from state waters, then the major human consequence of the quota reduction is the near-term decrease in revenues which occurs from postponing a portion of the harvest of surfclams to a later year. It is unlikely, however, that all the other conditions which held true previously will pertain again for the next three years. Reducing the quota for the next three years could possibly affect the long-term growth of the industry, if industry is correct and the total demand for both species of clams is growing.

5.1.4 Alternative S4 – No Action (Quota Removed)

Section 5.03 (b) of NOAA Administrative Order 216-6, "Environmental review procedures for implementing the National Environmental Policy Act," states that "an Environmental Assessment (EA) must consider all reasonable alternatives, including the preferred action and the no action alternative." Consideration of the "no action" alternative is important because it shows what would happen if the proposed action is not taken. Under the no action alternative, the quotas, which determine the maximum amount of landings of surfclams and ocean quahogs, would not be implemented for 2011, 2012, or 2013. The implications of the no action alternative are substantial. The no action alternative would force NMFS to specify quotas for these fisheries in order to comply with the National Standards. Monitoring the landings is essential for these fisheries and forms the backbone of the current management system under the FMP. Implementation of the no action alternative would be inconsistent with the goals and objectives of the FMP and its implementing regulations. Even though these quotas have not been fully harvested in the most recent years, the no action alternative has the potential to result in overfishing. Thus, the no action alternative is not considered to be a reasonable alternative to the preferred action.

5.2 Surfclam Minimum Size Limit

5.2.1 Preferred Alternative 1 (Suspension of Minimum Size – Status Quo)

The Surfclam and Ocean Quahog FMP includes a provision for a minimum size limit of 4.75 inches on surfclams, which may be used to protect new year classes from harvest before they reach an optimal size. This provision is written such that the 4.75 inch minimum size will automatically be in effect unless the Council and NMFS take the active step of suspending it. The current stock is comprised of large, adult individuals, with few small individuals apparent from landings in most areas (USDC 2009b). The Witzig (2009) report concluded that for 2009, only 6.1% of the surfclam landings were smaller than 4.75". Reinstating a minimum size under these conditions would result in greater harm than benefit, as it would require the industry to use "sorting" machines which will often damage undersized clams as it routes them back overboard.

It is, therefore, the Council's recommendation that the surfclam minimum size limit be suspended for 2011, 2012, and 2013, as has been done every year since 1990. Continuing the suspension will have no impact on the current fishery or resource.

5.2.2 Alternative 2 (No Action)

Alternative 2 would implement the reverse of Alternative 1, and the 4.75 inch minimum surfclam size limit would be implemented. The Witzig 2009 report identifies that only 6.1% of the landed surfclams were smaller than 4.75 inches. It is believed that there are no current at sea discards. Survival rates of discarded clams are greater than 50%, so even if all the clams smaller than 4.75 inches were discarded, the result would only be about 3% of the annual landings. The most recent SAW (USDC 2009b) considers that this resource "is not overfished and overfishing is not occurring".

5.3 Ocean Quahog *(Arctica islandica)* Quota

5.3.1 Preferred Alternative (Q3) - 5.333 Million Bu. (Status Quo)

The Council proposes to continue the ocean quahog quota of 5.333 million bushels, which is the quota that has been in place since 2005. There is no biological reason that the resource can not support this level of quota given the most recent stock assessments (USDC 1998b, 2000b, 2004, 2007b and 2009a). The 1997 (4.317 million bushels) and 1998 (4.000 million bushels) reductions were based on evaluation of the harvest level, which would satisfy the previous Council policy of a harvest level which could be maintained for at least 30 years given the information prior to the 1998 assessment (USDC 1998b).

5.3.2 Alternative Q1 - 4.000 Million Bu.

The minimum quota allowed under the FMP's OY definition is the alternative for 4.000 million bushels, which was not chosen by the Council because it would be constraining to industry and there is no biological reason to constrain industry at this time. The 4.000 million bushel level is the level the Council selected in 1998 and was a reduction of 7.3% from 1997.

As with the surfclam resource, the vast majority of ocean quahogs that are left unharvested in the next three years will still be available to the same allocation holders in subsequent years. Earnings are simply deferred rather than lost, with the ocean quahogs being stored in the ocean rather than in refrigerated containers or cans.

5.3.3 Alternative Q2 - 5.000 Million Bu.

This quota would be similar to the quota implemented in 2004 and would be a slight decrease from the current levels. This level was not chosen by the Council because it could be constraining to industry and there is no biological reason to constrain industry at this point. With the past four surveys and assessments showing that there is sufficient resource, the Council elected to have a slight increase for 1999, and maintain that level for 2000, 2001, 2002, and 2003, in order to allow the industry to grow. They recommended a 2004 quota that allowed the industry to continue to grow. Industry has requested that they be allowed to continue to keep the quota at 5.333 million bushels.

As with the surfclam resource, the vast majority of ocean quahogs that are left unharvested in the next three years will still be available to the same allocation holders in subsequent years. Earnings are simply deferred rather than lost, with the ocean quahogs being stored in the ocean rather than in refrigerated containers or cans.

5.3.4 Alternative Q4 - 6.000 Million Bu.

This is the maximum of the OY range for ocean quahog quotas and would be a quota increase of 13% above the status quo.

5.3.5 Alternative Q5 - No Action (Quota Removed)

Section 5.03 (b) of NOAA Administrative Order 216-6, "Environmental review procedures for implementing the National Environmental Policy Act", states that "an Environmental Assessment (EA) must consider all reasonable alternatives, including the preferred action and the no action alternative." Consideration of the "no action" alternative is important because it shows what would happen if the proposed action is not taken. Under the no action alternative, the quotas, which determine the maximum amount of landings, would not be implemented for 2011, 2012, and 2013 unless NMFS did it unilaterally to meet the National Standards. The implications of the no action alternative are substantial. Monitoring the landings is essential for these fisheries and forms the backbone of the current management system under the FMP. Implementation of the no action alternative would be inconsistent with the goals and objectives of the FMP and its implementing regulations. Even though annual quotas have not been fully harvested recently, the no action alternative could result in overfishing. Thus, the no action alternative is not considered to be a reasonable alternative to the preferred action.

5.4 Maine Ocean Quahog Quota

5.4.1 Preferred Alternative (M3) – 100,000 Bu. (Status Quo)

Four alternative quotas are presented for the Maine ocean quahog fishery. Alternative M3 would maintain the status quo quota at the maximum allowable level of 100,000 Maine bushels.

The Council recommends that the Maine ocean quahog quota for the next three years remain unchanged at the initial maximum quota of 100,000 Maine bushels (1 bushel = 1.2445 cubic feet).

5.4.2 Alternative M1 – 50,000 Bu.

Alternative M1 corresponds to a 50% reduction from the maximum allowable quota under the current management plan. The status quo quota of 100,000 bushels has been consistently caught every year except when the fishery was closed due to PSP. The most recent assessment (USDC 2009a) indicates that the Maine mahogany ocean quahog area is currently experiencing an F of 0.021. The ocean quahog fishery overall is not overfished, and overfishing is not occurring. There does not appear to be any reason to constrain the fishery to this low level of landings.

5.4.3 Alternative M2 – 90,000 Bu. (Slight Decrease)

Alternative M2 corresponds to a 10% reduction from the current status quo quota of 100,000 Maine bushels. It was proposed to provide the Council with an option for a modest change in the direction of the quota should they feel it warranted.

5.4.4 Alternative M4 - No Action (Quota Removed)

Section 5.03 (b) of NOAA Administrative Order 216-6, "Environmental review procedures for implementing the National Environmental Policy Act", states that "an Environmental Assessment (EA) must consider all reasonable alternatives, including the preferred action and the no action alternative." Consideration of the "no action" alternative is important because it shows what would happen if the proposed action is not taken. Under the no action alternative, the quotas, which determine the maximum amount of landings of surfclams and ocean quahogs, would not be implemented for 2011, 2012, or 2013 unless NMFS unilaterally implemented quotas to meet the National Standards. The implications of the no action alternative are substantial. Monitoring the landings is essential for these fisheries and forms the backbone of the current management system under the FMP. Implementation of the no action alternative would be inconsistent with the goals and objectives of the FMP and its implementing regulations. Thus, the no action alternative is not considered to be a reasonable alternative to the preferred action.

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND FISHERIES

6.1 Description of Surfclam and Ocean Quahog Resources

6.1.1 Surfclam Resources

Surfclams are bivalve mollusks which are distributed in the western North Atlantic from the southern Gulf of St. Lawrence to Cape Hatteras, North Carolina. Commercial fisheries have generally concentrated on the populations of surfclams which have flourished in the sandy shallow ocean sediments off the coasts of New Jersey and the Delmarva peninsula. Growth rates are relatively rapid, with surfclams reaching preferable/harvestable size (approximately 5 inches) in about five to six years. Maximum size is about nine inches in length, though individuals larger than eight inches are rare. They have a longevity of approximately 35 years, and while some individuals reach sexual maturity within three months, most spawn by the end of their second year.

The Atlantic surfclam stock in the US EEZ is not overfished, and overfishing is not occurring (USDC 2009b and Appendix 3). Estimated fishable stock biomass in 2008 (survey year) was 1.93 billion pounds of meats, which is above the management target of ½ the 1999 biomass level of 1.19 billion pounds of meats (Table 4). Estimated fishing mortality in 2005 was 0.027, which is below the management threshold of 0.15. These SAW estimates are for the entire EEZ stock, including the portion of the EEZ stock on GBK which is not currently available because of Paralytic Shellfish Poisoning (PSP).

The most important development in the surfclam resource over the past several years has been the dramatic reduction in biomass evident in the New Jersey inshore area and off the coast of the Delmarva peninsula. The loss of the biomass in the southern end of the species' range was identified in the 2003 SARC (USDC 2003) and was the impetus for a NEFSC and industry-sponsored research effort in the summer of 2004 (USDC 2005). This joint survey (only on the portion of the surfclam resource south of Hudson Canyon) documented the large decline in the portion of the resource off of Delmarva (DMV) but found more biomass off northern New Jersey (NJ) than was estimated from the 2002 NEFSC survey. In fact, the 2004 survey indicated the same biomass that was found in NJ as was found there in the 1997 and 1999 surveys. Strong recruitment occurred recently in the two NJ mid-depth strata but not in shallower strata of NJ or in DMV (USDC 2005).

Recruitment has been below average since 1999 (USDC 2009b). The last strong year classes on GBK, NJ, and DMV occurred in 1999, 1992, and 1993 respectively. The full assessment report describes factors that may have reduced recent recruitments in the DMV and NJ regions.

The surfclam stock biomass is declining from record-high levels during the late 1990s toward lower levels similar to the early 1980s. High biomass during the late 1990s was due to relatively high recruitment and relatively fast growth rates in the southern region in the past. Fishable biomass in 2008 was 1.93 billion pounds of meats, which has declined about 3% per year since the late 1990s.

The decline is surfclam biomass since the late 1990s can be explained by negative surplus production caused by lower recruitment and slower growth rates in the NJ and DMV regions. The fishery appears to have been a secondary factor. When surplus production is negative, stock

biomass will decline, even when no fishing occurs. When fishing occurs, stock biomass will decline whenever catch exceeds surplus production.

Regions with the highest fishable biomass shifted from the south to the north during 1982-2008 (USDC 2009b). During 1982, Delmarva held the largest fraction of fishable surfclam biomass. The fraction of total biomass in Delmarva increased through the late-1980s and then declined to the current relatively low level. New Jersey held the largest share of surfclam biomass during 1994-2002. During 2008, the largest share of surfclam biomass was in the GBK area due to declining biomass in DMV and NJ. This has been a huge change where in 1986 DMV and SVA had 55% of the biomass and now in 2008 only has 5%, while GBK in 1986 had 5% and now has 48%. New Jersey has maintained its share of the biomass in that it had 32% in 1986 and 22 years later it still has 30%.

The surfclam stock assessment (USDC 2009b) produces projections and provides decision table analyses. Biological reference points for biomass and fishing mortality were required by the Sustainable Fisheries Act (SFA) of 1996 and proposed by the Council in 1999 under Amendment 12 (MAFMC 1999). The 1999 reference points for biomass were rejected by the Agency because they were for the New Jersey portion of the resource only. New and approved biomass reference targets and thresholds for the entire surfclam resource were the focus of Amendment 13 (MAFMC 2003).

This quota recommendation paper is for 2011, 2012 and 2013 only. Amendment 13 allowed the Council to set multi-year quotas for three years based on a new survey and assessment every three years. It was initially anticipated that with the *RV Delaware II* being decommissioned soon, there would need to be a move of the survey to an industry platform. Initially, that could have delayed the completion of a new assessment in 2012. The plan now is to conduct one more clam survey in 2011 on the *Delaware II* and maintain the three year schedule. MAFMC staff was anticipating a potential delay and requested five-year projections during the stock assessment, and that is why projections are run through 2015 rather than simply three years through 2013.

Forecast results (USDC 2009b) indicate that surfclam biomass will continue to decline slowly through 2015. In all cases, this occurs because surplus production has been negative and is likely to remain negative due to poor recruitment and slow growth in the more southern regions.

Fishing mortality at the proxy for MSY times the current biomass would yield a catch of 251.3 million pounds of meats (14.8 million bushels). Surfclams were overfished in the mid 1970s (prior to management) when 75 to 90 million pounds of meats were landed for a couple of years. The Council has a specified OY range in the FMP (since the early 1980s) of 31.5 to 57.8 million pounds (1.85 to 3.4 million bushels). A plan Amendment would be required to change this OY range.

The probability of overfishing and overfished status for this stock appears low under all of the states of nature considered (USDC 2009b Table A1). Projections for decision table analysis included three values for natural mortality (low (0.1), medium (0.15) and high (0.2) levels) and three survey dredge catchabilities as "states of nature".

6.1.2 Ocean Quahog Resources

Ocean quahogs are found in the colder waters on both sides of the North Atlantic. Off the United States and Canada, they range from Newfoundland to Cape Hatteras at depths from 25 feet to 750 feet. Industry has been pressing the limits of current technology in harvesting ocean quahogs as deep as 300 feet in the waters off southern New England. As one progresses northward, ocean quahogs inhabit waters closer to shore.

Ocean quahogs are one of the longest-living, slowest growing marine bivalves in the world. They live to more than 100 years old. Ocean quahogs have been aged in excess of 200 years. They require roughly twenty years to grow to the sizes currently harvested by the industry (approximately 3 inches) and reach sexual maturity between 5 and 10 years of age.

The ocean quahog stock in the US EEZ is not overfished and overfishing is not occurring (USDC 2009a and Appendix 4). Estimated fishable stock biomass during 2008 (survey year) was 6.4 billion pounds of meats, which is above the management target of ½ the virgin (1978 pre-fishery) biomass level of 3.9 billion pounds of meats (Table 4). Estimated fishing mortality during 2008 for the exploited region (all areas except GBK) was 0.010, which is significantly below the current approved management threshold of 0.05 (MAFMC 1999). The estimated fishing mortality is still less than half the SARC (USDC 2009a) recommended and Council-approved definition proposed for Amendment 15 that is under development. These estimates for ocean quahogs in the US EEZ do not include Maine waters, which were assessed separately (see below). However, biomass and landings for Maine waters are minor and would have no appreciable effect on estimates for the whole stock (USDC 2009a).

Mean annual recruitment to the whole stock was small (less than 1% per year). A pulse of recruitment in Long Island has finished growing to fishable size, based on survey data collected during 2008. Survey size frequency data in 2008 indicate an increasing number of pre-recruits in parts of Southern New England and GBK. Recruitment of these individuals to the fishable stock is expected to occur over the next decade.

The fishable stock biomass in 2008 was 6.4 billion pounds of meats (USDC 2009a). Estimated virgin biomass in 1978 was 7.9 billion pounds of meats. The ocean quahog population is a relatively unproductive stock that is being fished down from its virgin state towards the B_{msy} reference point. After several decades of relatively low fishing mortality, the stock is still at 81% of the pre-fishing level.

Based on NEFSC survey data, LPUE data and biomass estimates for 1977-2008, declines in stock biomass are most pronounced in southern regions. In particular, stock biomass is below the one-half virgin level in the Southern Virginia, Delmarva, and New Jersey regions (USDC 2009a).

An increasingly large fraction of the stock (84% during 2008 compared to 67% during 1978) now occurs in the northern regions (Long Island, Southern New England, and Georges Bank). The GBK region is of particular importance because it contained 33% of total biomass in 1978 and 45% of total biomass in 2008. Georges Bank has been closed to fishing since 1990 because of PSP, but may be opened to fishing later this summer (see PSP discussion).

The SARC summary (USDC 2009a) produces projections and provides decision table analyses. Biological reference points for biomass and fishing mortality were required by the SFA of 1996 and proposed by the Council in 1999 under Amendment 12 (MAFMC 1999) and approved by the

Secretary (Table 4). New, more conservative biological reference points were recommended by the 2009 SARC for biomass threshold, fishing mortality threshold, and fishing mortality target (Table 4). These proposed reference points were endorsed by the FMAT in August 2009 and approved by the Council (October 2009) for inclusion in Amendment 15.

Based on a review of F_{MSY} reference points of long-lived West Coast groundfish species the 2009 SARC recommended $F_{threshold}$ is $F_{45\%} = 0.0219$. The new SARC recommended biomass threshold of 3.2 billion pounds of meats is 40% of the 1978 pre-fishery biomass. This recommended biomass threshold is *ad hoc*, but it is probably better than the current biomass reference point both in relation to $F_{45\%}$ and in maintaining a productive stock for the long term (USDC 2009a).

This quota recommendation paper is for 2011, 2012 and 2013 only. Amendment 13 allowed the Council to set multi-year quotas for three years based on a new survey and assessment every three years. There is a desire, with the *RV Delaware II* being decommissioned soon to move the survey to an industry platform. Initially, that could have delayed the completion of a new assessment in 2012. The desired plan now is do conduct one more survey in 2011 on the *Delaware II* and maintain the three-year schedule. MAFMC staff was anticipating a potential delay and requested five-year projections and that is why projections are run through 2015 rather than simply three years through 2013.

Projection results indicate that overfished (low biomass) stock conditions are not likely to occur by 2015 under any of the states of nature or management policies considered in projections. Overfishing (F too high) is unlikely to occur in 2015 at status-quo or at the current FMP OY minimum (USDC 2009a). However, there is some probability of overfishing in 2015 for landings as high as the current quota or the maximum OY allowed by the FMP if the F is calculated for just the "exploited" stock. The Amendment 12 (MAFMC 1999) argued that the fishing mortality reference points should be compared to only the proportion of the stock that is exploitable and not the biomass that is not available due to area closures (i.e., GBK). The Regional Office had recently developed an Environmental Assessment and published a proposed rule (75 *Federal Register* 37745; June 30, 2010) for opening GBK to fishing for the first time in two decades. Should the entire GBK area be available to fishing, the entire biomass will then be used as a comparison for the reference points which will bring in the 45% of the resource that is on GBK. There is then no probability of overfishing for the entire stock even at the maximum level of 6 million bushels allowed by the FMP.

The $F_{45\%}$ recommended new threshold times the current biomass would yield a catch of 140.5 million pounds of meats (14.0 million bushels; USDC 2009a Table B1). Ocean quahogs have never been overfished since the inception of the fishery in the late 1970s. The Council has a specified OY range in the FMP (since the early 1980s) of 40.0 to 60.0 million pounds (4 to 6 million bushels). A plan Amendment would be required to change this OY range.

The probability of overfishing and overfished status for this stock appears low under all of the range of catches allowed by the FMP and states of nature considered (USDC 2009a Table B27). Projections for decision table analysis included three values for natural mortality (low (0.015), medium (0.020) and high (0.025) levels).

In 2006 and 2009, Maine conducted its own stock assessment, complete with dredge efficiency estimates, which was peer-reviewed as part of the ocean quahog SARC (Appendix 4). There are two principal fishing grounds for ocean quahogs in Maine waters, which cover about 60 nautical

square miles. Landing peaked in 2002 at nearly 129,000 bushels and then declined in the following years until rebounding in 2006 (Appendix Table 2). The most productive eastern fishing grounds were reopened by the State of Maine in late 2005 after three years of closure due to PSP contamination.

Fishable biomass in Maine waters in 2008 was estimated to be nearly 37 million pounds or 3.3 million Maine bushels. Logbook data show that LPUE (Appendix Table 2) levels have declined since the peak in 2000 but remain relatively high overall. The Maine fishery is small, relative to the rest of the EEZ, and unique. In particular, the Maine fishery exploits relatively small ocean quahogs at a rate where F = 0.021. That fishing mortality is approximately double that of the remainder of the exploitable stock.

6.2 Description and Identification of Essential Fish Habitat (EFH)

According to Section 600.815 (a)(1), FMPs must describe EFH in text and with tables that provide information on the biological requirements for each life history stage of the species. These tables should summarize all available information on environmental and habitat variables that control or limit distribution, abundance, reproduction, growth, survival, and productivity of the managed species. The surfclam and ocean quahog EFH background documents (Appendices 5 and 6 of Amendment 13) are considered the best scientific information available for EFH in order to meet National Standard 2 of the MFCMA and were relied upon heavily in this section. There is no new information to update these sections at this time. Amendment 15 that the Council is developing will have new updated EFH information.

Amendment 12 (MAFMC 1999) identified and described essential fish habitat for surfclams and ocean quahogs in Section 2.2.2. No new habitat information is known to exist that would provide the basis for changing the EFH identification and description that was developed in Amendment 12. Amendment 15 is under development and will have new updated EFH information.

Surfclams

Juveniles and adults: Throughout the substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of GBK and the Gulf of Maine throughout the Atlantic EEZ, in areas that encompass the top 90% of all the ranked ten-minute squares for the area where surfclams were caught in the NEFSC surfclam and ocean quahog dredge surveys (Amendment 13 Figures 30 and 31). Surfclams generally occur from the beach zone to a depth of about 200 feet, but beyond about 125 feet abundance is low.

Ocean quahogs

Juveniles and adults: Throughout the substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of GBK and the Gulf of Maine throughout the Atlantic EEZ, in areas that encompass the top 90% of all the ranked ten-minute squares for the area where ocean quahogs were caught in the NEFSC surfclam and ocean quahog dredge surveys (Amendment 13 Figures 32 and 33). Distribution in the western Atlantic ranges in depths from 30 feet to about 800 feet. Ocean quahogs are rarely found where bottom water temperatures exceed 60 ^{o}F, and occur progressively farther offshore between Cape Cod and Cape Hatteras.

6.3 Description of Endangered and other Protected Resources

There are numerous species which inhabit the environment within the management unit of this FMP that are afforded protection under the Endangered Species Act (ESA) of 1973 (i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA). Fourteen are classified as endangered or threatened under the ESA, while the remainder are protected by the provisions of the MMPA. The Council has determined that the following list of species protected either by the Endangered Species Act of 1973 (ESA), the Marine Mammal Protection Act of 1972 (MMPA), or the Migratory Bird Act of 1918 may be found in the environment utilized by Atlantic surfclam and ocean quahog fisheries:

Cetaceans

Species	Status
Northern right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*	Endangered

Sea Turtles

Species	Status
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered
Loggerhead sea turtle (*Caretta caretta*)	Threatened

Fish

Species	Status
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered
Smalltooth sawfish (*Pristis pectinata*)	Endangered

The status of these and other marine mammal populations inhabiting the Northwest Atlantic has been discussed in detail in the U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments. Initial assessments were presented in Blaylock *et al.* (1995) and are updated in Waring *et al.* (2009). The most recent information on the stock assessment of various mammals can be found at: *http://www.nmfs.noaa.gov/pr/sars/.*

Three other useful websites on marine mammals are: *http://www.nmfs.noaa.gov/pr/recovery, http://spo.nwr.noaa.gov/mfr611/mfr611.htm, and http://www.nmfs.noaa.gov/pr/species/mammals*.

The only gear used for the surfclam and ocean quahog fisheries is clam dredges, which are now included in the List of Fisheries for 2010 as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 118 of the Marine Mammal Protection Act (MMPA) of 1972. In addition, the proposed actions will not significantly increase fishing

effort. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery.

The range of surfclams, ocean quahogs, and the above marine mammals and endangered species overlap to a large degree, and there always exists some very limited potential for an incidental kill. Except in unique situations (e.g., tuna-porpoise in the central Pacific), such accidental catches should have a negligible impact on marine mammal/endangered species abundances. The implementation of these quotas will not likely have any adverse impact upon these populations. While marine mammals and endangered species may occur near surfclam and ocean quahogs beds, it is highly unlikely any significant conflict between the fishermen managed by this FMP and these species would occur. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. Additionally, surfclams and ocean quahogs are benthic organisms, while marine mammals and marine turtles are mostly pelagic and spend nearly all of their time up in the water column or near the surface.

6.4 Description of Fishery and Socioeconomic Environment

6.4.1 Port and Community Description

For Amendment 13 (MAFMC 2003) to this FMP, the Council hired Dr. Bonnie McCay and her associates at Rutgers University to describe the ports and communities that are associated with the surfclam and ocean quahog fisheries. The researchers did an extensive job of characterizing the three main fisheries. The description of the fishing gear, areas fished, etc. are fully described in Amendment 13 (MAFMC 2003).

Communities from Maine to Virginia are involved in the harvesting and processing of surfclams and ocean quahogs. Ports in New Jersey and Massachusetts handle the most volume and value, particularly Atlantic City, Point Pleasant, New Bedford, and Cape May/Wildwood. There are also significant landings in Ocean City, Maryland, Warren, Rhode Island, and the Jonesport and Beals Island areas of Maine. The Maine fishery is entirely for ocean quahogs, which are sold as shellstock for the half-shell market. The other fisheries are industrialized ones for surfclams and ocean quahogs, which are hand-shucked or steam-shucked and processed into fried, canned, and frozen products. Processing plants are therefore major components of the fishery, and the communities in which they are found must be described as well as the port towns. Some of them meet the definition of "fishing community" found in the Sustainable Fisheries Act of 1996: "[t]he term "fishing community" means a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community." The McCay team characterizations of the ports and communities are based on government census and labor statistics and on observations and interviews carried out during the late 1990s and in the fall of 2001.

6.4.2 Federal Fleet Profile

As described in other portions of this document, the total number of vessels participating in the surfclam and ocean quahog fisheries outside the State of Maine has experienced a dramatic decline as the fisheries moved beyond a market crisis in 2005. The 50 or so vessels that reported

landings during 2004 and 2005 was slashed and coast-wide harvests consolidated on to approximately 40 vessels in the subsequent years. The Maine ocean quahog fleet numbers started to decline substantially in 2006 and totaled 19 in 2009.

Table 9. Federal Fleet Profile, 1997 through 2009.

Non-Maine Vessels	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Harvests BOTH surfclams and ocean quahogs	14	14	8	11	12	14	16	11	14	12	9	9	8	8
Harvests only surfclams	20	19	23	22	19	21	23	23	21	24	20	24	24	28
Harvests only ocean quahogs	22	17	16	12	17	16	15	16	15	12	9	8	10	7
Total Non-Maine Vessels	56	50	47	45	48	51	54	50	50	48	38	41	42	43
Maine Ocean Quahog Vessels	25	34	39	38	34	31	35	35	34	32	25	24	22	19

Source: NMFS Clam Vessel Logbooks

6.4.3 Processing Sector

In 2009, there were a total of 10 companies reporting purchases of surfclams or ocean quahogs from the industrial fisheries outside of Maine. Council staff is aware of 12 processing facilities operated by these companies. The following is a list of their names and the species they processed, arrayed from north to south.

<u>Massachusetts</u>
- Blount Seafood (Fall River) Surfclams and ocean quahogs
- Fair Tide Shellfish (New Bedford) Surfclams only; hand-shucked
- Intershell Seafood (Gloucester) Surfclams only
- Sea Watch (New Bedford) Surfclams and ocean quahogs

(Harbor Blue Seafood (Fairhaven) - Offloading of surfclams only - no processing)

<u>Rhode Island</u>
- Blount Seafood (Warren) Surfclams and ocean quahogs
- Galilean Seafood (Bristol) Surfclams only; hand-shucked. Owned by Atlantic Cape Fisheries.

<u>New Jersey</u>
- Atlantic Capes Fisheries (Point Pleasant Beach) Surfclams only; hand-shucked. Offices in Cape May.
- La Monica Fine Foods (Millville) Surfclams only; hand-shucked
- Surfside Products (Port Norris) Primarily ocean quahogs, some surfclams

<u>Delaware</u>
- Sea Watch (Milford) Surfclams and ocean quahogs

<u>Maryland</u>
- Sea Watch (Easton) - Secondary processing

Virginia
- J H Miles and Company (Norfolk) Surfclams and ocean quahogs

6.4.4 Fisheries for Surfclams

6.4.4.1. The New Jersey inshore fishery for surfclams

The surfclam resource within New Jersey state waters is the most closely monitored of any on the East Coast. State officials estimate the biomass declined from 17.4 million bushels in 1997 to 1.71 million bushels in 2008. The New Jersey quota was reduced from 600,000 bushels in the 2002/2003 season to 275,000 bushels in the 2003/2004, and had been reduced to the 10% minimum biomass figure of 198,000 bushels for 2007/2008. The quota for 2008/2009 was set at a very conservative level of 58,368 bushels and the 2009/2010 quota was reduced even further to 55,296 bushels. Fishermen were unable to harvest even these reduced amounts, and in the previous four fishing seasons (2005/2006, 2006/2007, 2007/2008, and 2008/2009) the fishery was virtually non-existent, while during this current season only 1,152 bushels have been landed of inshore New Jersey surfclams.

New Jersey conducts a survey every summer and produces a surfclam resource report every three to five years. The total surfclam standing stock for New Jersey territorial waters from Shark River Inlet to Cape May in the summer of 2009 was 1.81 million bushels. Survey work in 2010 will be completed in August (Normant pers comm). Annually, the state surveys about 330 stations. The biomass of inshore New Jersey surfclams has fallen precipitously and continuously from the high in 1997 of 17.4 million bushels. The overall length-frequency distributions of the surfclam resource has not changed dramatically, but the mean shell lengths have been steadily increasing since 1993. The mean shell length of surfclams found in 1993 was 3.9 inches and has steadily increased to a mean shell length of 5.5 inches in 2009. The number of clams per bushel has also decreased (from the increase in the mean size) from 202 clams per bushel in 1995 to 85 clams per bushel in 2009. This points out that while the volume (biomass) is down, the actual number of individuals is down even further. The most notable difference recently has been the lack of clams collected that were less than 2.7 inches in the last several years. During the past ten completed surveys, there have been less than 450 total clams collected that were less than the 2.7 inches, whereas during the early to mid-1990s there were thousands of small clams collected in each individual survey (Normant pers comm).

New Jersey establishes an annual quota for its inshore surfclam fishery with a minimum constraint that the quota can not exceed 10% of the estimated standing stock or a maximum of a million bushels. A constant annual quota of 600,000 bushels had been maintained for years until the 1999/2000 season. New Jersey is unique in defining a season which begins in October of one calendar year and closes at the end of May in the next.

The quota was increased to 700,000 bushels for the 1999/2000 season based on the very high biomass estimated from the 1999 survey. With the lack of recruitment, the State of New Jersey lowered the quota back to 600,000 bushels for the 2002/2003 season. The quota has been reduced consistently since then.

Stock biomass continued to decline, obliging the state to dramatically cut the quota for 2003/2004

to only 275,000 bushels. The industry found the sparse beds uneconomical to fish, and left 28% of the quota unharvested. Harvests have continued to decline every year since, and in the 2005/2006 season, the 2006/2007 season, the 2007/2008 season and the 2008/2009season, the commercial fishery was virtually shut down. Though the state published a quota of 237,000 bushels (2005/2006) and a quota of 240,000 (2006/2007), a mere 480 bushels was taken in late January of 2006 and even less (448) in 2007. No landings occurred between October 2007 and mid-May 2008. No landings were reported for 2008/2009 and the quota was a mere 58,368 bushels. There was 1,152 bushels landed through mid-April 2010 of the 55,296 bushel quota.

There is a limited (around 50,000 bushels/year) surfclam "bait" fishery that occurs in contaminated waters of northern New Jersey.

Table 10. New Jersey Annual Surfclam Quota and Landings (Bushels).

Season (Oct - May)	Quota (bu)	Landings (bu)	Bushels Unharvested	Percent Unharvested
FY 95/96	600,000	566,120	33,880	6%
FY 96/97	600,000	468,377	131,623	22%
FY 97/98	600,000	467,569	132,431	22%
FY 98/99	600,000	570,852	29,148	5%
FY 99/00	700,000	699,649	351	.05%
FY 00/01	700.000	700,256	(256)	(0.04%)
FY 01/02	700,000	702,257	(2,257)	(0.3%)
FY 02/03	600,000	601,056	(1,056)	(0.2%)
FY 03/04	275,000	197,152	77,848	28%
FY 04/05	350,000	60,600	289,400	83%
FY 05/06	237,000	480	236,520	99.8%
FY 06/07	240,000	448	239,552	99.8%
FY 07/08	198,000	0	198,000	100%
FY 08/09	58,368	0	58,368	100%
FY 09/10*	55,296	1,152	54,144	97.9%

* Landings for 2009/2010 not final.

Source: New Jersey Division of Fish and Wildlife.

There are 54 licenses for the inshore New Jersey surfclam fishery. Up to three licenses can be combined onto one vessel. Each license receives an equal share of the annual quota, and those fishermen can fish their quota whenever it is appropriate for them to fish.

D. The New York Inshore Fishery for Surfclams

New York inshore waters are divided into two segments: Long Island Sound and the Atlantic Ocean (state territorial waters out to three miles). The annual harvest limit for Long Island Sound is 50,000 bushels (this pertains to only those surfclams taken by mechanical means, hydraulic dredge or patent tongs), but landings have been less than 5,000 bushels annually in years prior to 2003. Landings greatly increased in 2003, to 57,000 bushels, and the fishery was closed in May of that year. In 2004, nearly 63,000 bushels were taken by hydraulic dredge before the fishery was closed again in March. Another 61,000 bushels were taken by hand (raking) for a total of over 124,000 bushels harvested from Long Island Sound. In 2005, the market for surfclams from Long Island Sound dropped; only 45,000 bushels were taken by dredge and none by hand, and by 2006 only 448 bushels were harvested. Harvests increased slightly in 2007 to 705 bushels, and then increased substantially in 2008 to 3,798 bushels. In 2009, there were 5,317 bushels harvested from Long Island Sound, so markets for surfclams taken from the Sound have improved somewhat, though these harvests are mainly attributable to the efforts of a single vessel (Dahl pers comm).

Most of the harvest from New York state waters is from the Atlantic Ocean. Currently, there are 15 vessels harvesting surfclams by mechanical means (Dahl pers comm).

Table 11. New York Annual Surfclam Quota and Landings (Bushels).

Year	Quota (bu)	Harvest (bu)	Percent Over or Under Quota
1990	(none)	720,473	
1991	(none)	713,019	
1992	(none)	719,351	
1993	(none)	856,366	
1994	500,000	494,489	1 % under
1995	500,000	410,137	18 % under
1996	500,000	447,780	10 % under
1997	500,000	388,829	22 % under
1998	500,000	233,902	53% under
1999	500,000	269,867	46% under
2000	500,000	339,142	32% under
2001	500,000	443,859	11% under
2002	500,000	501,290	0.3% over
2003	500,000	494,051	1.2% under
2004	930,000	882,969	5.0% under
2005	500,000	489,046	2.2% under
2006	500,000	407,254	19% under

2007	400,000	376,510	6% under
2008	400,000	347,612	13.1% under
2009	300,000	294,921	1.7% under
Source: NYS Dept. of Environmental Conservation.			

The average catch from New York waters was approximately 173,000 bushels annually for the 20-year period spanning the 1970s and 1980s. Catches soared in 1990 with implementation of ITQ management in the federal fishery, as surplus vessels from the federal fishery sought alternative areas to fish.

Harvests peaked in 1993 at just over 850,000 bushels, then trended downward through 1998, when the market for surfclams began shrinking in the mid-1990s and the black, lower-yielding resource from New York's state waters in the Atlantic was less desirable. From 1999 through 2004, landings increased steadily and reached a maximum of 883,000 bushels in 2004. The market again began to shrink and landings fell to 489,046 bushels in 2005, and then to only 407,254 bushels in 2006. This downward trend in landings is evident for 2007, 2008, and 2009 as well, with 376,510 bushels, 347,612 bushels, and 294,921bushels harvested, respectively, though the reduced catch was due in part to reduction in quota as a result of data from the 2006 population assessment.

The New York State Department of Environmental Conservation (DEC) staffer who headed their surfclam program until recently was Maureen Davidson. In a May 2005 contact she stated that landings had been increasing steadily for the past five years, and were no longer below the annual quota. Landings were typically restricted by a vessel limit of 21 cages per week. At times the weekly limit has been reduced to 14 cages to prevent landings from exceeding the quarterly and annual harvest limits. In the first quarter of 2003, boats were allowed 21 cages initially, but as it became apparent that landings would exceed the quarterly limit, they were reduced to 14 cages per boat per week. In 2004, with the nearly doubling of the annual harvest limit, boats were allowed to catch 28 cages per week. In 2005, boats were allowed to catch 21 cages per week for the first quarter and were then reduced to 14 cages per week for the remainder of the year. The weekly harvest limit continued at 14 cages for the first three quarters of 2006, and then increased to 21 cages for the last few weeks of the year. In 2007, the harvest limit remained at 14 cages per week for the entire year, except for the last few weeks of the year when the limit was again increased to 21 cages. The 14 cage limit was re-instated early in 2008 and has remained at this limit to the present (Dahl pers comm).

Table 12. New York Surfclam Population Estimates in the Territorial Sea.

Year	Bushels
1996	12.2 million
1999	12.8 million
2002	18.6 million
2005	10.2 million
2006	9.5 million

2008	6.8 million

Surfclam population assessment surveys are conducted by DEC personnel on board a chartered commercial fishing vessel. The 1996 survey estimated that there were 12.2 million bushels of surfclams in the 180 square nautical mile area that is New York's state waters in the territorial sea (Davidson pers comm). The 1999 survey showed a slight increase to 12.8 million bushels. The 2002 population estimate for New York state waters of the Atlantic Ocean was 18.6 million bushels of surfclams. Further analysis of the data showed an estimated population of 3.3 billion individual clams. The 2005 population estimate was 10.2 million bushels, a startling 45% decline from the 2002 survey estimate. This result is also reflected in the drop in the estimated number of individual clams to 1.1 billion. In the face of the 2005 results, DEC decided to keep the annual harvest limit at 500,000 bushels for 2006 and to conduct another survey during the summer of 2006. The results of that survey showed that the population had again declined, although not statistically significantly, to 9.5 million bushels, or approximately 1 billion individual clams. The proportion of clams smaller than the legal size limit of 4 inches (101 mm) has also declined in past years, from approximately 34% in 2002 to 1.6% in 2006. This indicates a large decline in recruitment of the resource. In light of the declining population and recruitment, the 2009 annual harvest limit was set at 300,000 bushels (Dahl pers comm).

The most recent population assessment survey was completed in the last quarter of 2008 and revealed that the status of the surfclam resource is not improving. In fact, population biomass has decreased by 28% since the 2006 survey, equating a reduction of 2.7 million bushels of clams to the current population estimate of 6.8 million bushels. In terms of individual clams, numbers have dwindled to 780 million, representing a 26% decline since the last survey in 2006. Given the continual decline of these surfclam population indices, the 2009 annual harvest limit was further reduced from that in 2007 and 2008, to 300,000 bushels. Though these data present a bleak outlook on the overall status of New York's surfclam population, and its ability to support a sustainable fishery, a ten-fold increase in the overall percentage of seed clams offers some hope for the future. While the percentage of the population consisting of sub-legal clams under 4 inches shell length was reported at 1.9% and 1.7% for the 2005 and 2006 surveys, respectively, the 2008 survey results indicate these young clams accounted for 10.3% of the population – an indication of some improvement in recruitment.

In 2003, there were 19 vessels participating in the fishery, followed by 20 in 2004. In both 2005 and 2006 the total increased to 22 vessels. In 2007 and 2008 less than 20 vessels were active, and that has continued to be the case where only 15 vessels fished in 2009. At the start of 2010, the New York state government moved this fishery to an Individual Fishing Quota (IFQ) system.

New York state continues to operate a limited surfclam fishery for bait from a specific area off the Rockaways.

6.4.4.3. The federal surfclam fishery

- In 2009, the industry reported harvesting a total of 2.594 million bushels of surfclams based on vessel logbook reports, a decrease of 11.2% from the prior year. Contributing factors likely include the soaring price of fuel in recent years, the economic downturn, and falling catch rates.

- Industry has experienced difficulty utilizing increases in both the federal surfclam and ocean quahog quotas that were implemented in 2004. In 2009, the unharvested portion of the surfclam quota equaled 24% of the 3.4 million bushel total.

- The most worrisome trend in the surfclam fishery continues to be the decline in the productivity of effort. The average number of bushels harvested in an hour of fishing is an important indicator of both the abundance of clams in the beds being fished, as well as the costs of fishing operations. Increases in fishing time from working on sparser beds translates directly into higher fuel costs.

- A fleet-wide calculation of surfclam Landings Per Unit of Effort (LPUE) has declined by an average of almost 10% each year between 2000 and 2009, from 129 to 52 bushels per hour (Appendix Table 1 and Appendix Figure 1). Appendix Figure 1 illustrates the decline as almost a straight line.

- The increased costs associated with longer fishing trips are magnified by the fuel price increases of the past several years. Industry members have mentioned that clam vessels operating hydraulic dredges have the additional expense of supplying fuel to the dredge pump engine.

- The need to maintain product freshness places an upper bound on how long vessels may remain at sea. In 2009 the average trip took 34.8 hours dock-to-dock; an increase of 6.4% over the prior year.

- The average ex-vessel price of a bushel of surfclams increased $0.06 to $11.97 in 2009. Price competition among purchasers may have lessened somewhat with the consolidation occurring in the industry, and reported ex-vessel prices may have less meaning from vertically-integrated firms that own both vessels and processing plants. Prices ranged from a low of $10.50 per bushel to a high of $18.50 for premium, high-yielding clams. Most trips were reported within a narrower range of $10.50 - $13.50 per bushel.

- The total ex-vessel value of the 2009 federal harvest was approximately $30.0 million, down 14.6% from 2008. [Note that price and value statistics presented in this document are those reported by industry processors and dealers. Prior documents relied on values reported by vessels.]

- Unlike the ocean quahog fishery, the surfclam fishery has been unable to find large, dense beds of high-yield surfclams to replace those that have been the mainstay of the fleet for many years. The high catch rates that were reported off eastern Nantucket Island have dropped substantially from the 200+ bushels per hour experienced when the dense beds were first discovered in 2004. The industry continues to depend most heavily on a single degree square off New Jersey: 3973. It supplied 55% of the 2009 federal harvest, down from 57% in 2008 (Appendix Table 3). Average catch rates in that square declined 9% in 2009, from 59 to 54 bushels per hour.

- A modest fishery for surfclams does persist at the southern end of its range, in the deeper waters off the coast of Maryland and Virginia. Degree square 3874 supplied 10% of the 2009 harvest at approximately 260,000 bushels (Appendix Table 3).

6.4.4.4. Economic and social environment of the EEZ surfclam fishery

Traditionally, surfclams' dominant use has been in the "strip market" to produce fried clams. In recent years, however, they have increasingly been used in chopped or ground form for other products, such as high-quality soups and chowders.

Ex-vessel prices for surfclams can vary considerably depending on the quality and meat yield of surfclams from a particular area. Surfclam beds in New York state waters and off the Delmarva peninsula tend to have lower meat weights and command lower prices. Prices will also depend on the nature and terms of contracts which fishermen and allocation holders enter into with processors. The markets for surfclams and ocean quahogs have varied over time, and individual fishermen may have chosen to accept a lower price for an allocation of one species in return for assurances that the processor will purchase his allocation of the other species.

The past several years have been extremely difficult for the East Coast clam industry. In 2005, a 'perfect storm' of conditions combined to result in a substantial portion of the industrial fleet leaving the clam fishery and greatly reduced operations at the second-largest processor in the clam industry. Eastern Shore Seafood Products of Mappsville, Virginia was a vertically-integrated company operating both vessels and a processing plant. In 2005, a deal was struck in which ownership of the plant and vessels were given over to an entity including the Truex, Meyers, Truex Group, and the Sea Watch management team.

A myriad of factors have contributed to the difficulties in the clam industry. Major users of clam meats have reduced their purchases from industry and stopped advertizing products like clam chowder in the media. Industry members reported that imported meat from Canada and Vietnam contributed to an oversupply of clam meats in the marketplace. The costs to vessels harvesting clams have increased due to the rising costs of fuel and insurance. Trips harvesting surfclams have increased in length as catch rates have declined.

6.4.5. Fisheries for Ocean Quahogs in the ITQ program

Since ocean quahogs typically occur in the deeper waters offshore, virtually the entire fishery is prosecuted in federal waters, with the exception of the Maine inshore fishery. Landings of ocean quahogs from the high-volume fishery outside the State of Maine totaled 3.4 million bushels in 2009.

6.4.5.1. The federal ocean quahog ITQ fishery

- Landings of ocean quahogs totaled 3.434 million bushels in 2009 based on vessel logbook reports, an increase of only 0.2% over 2008. The 2005 harvest of 2.940 million bushels was the lowest level experienced in the past 24 years. The ocean quahog fishery has been affected by the same market forces that reduced the harvests of surfclams, however the impact was more severe because their value is roughly half that of surfclams.

- Landings had been on a declining trend from 1992 to the year 2000, when the harvest of ocean quahogs was at its lowest level in two decades. Fully 30% of the 2000 federal quota was left unharvested, as declining catch rates and higher fuel prices had reduced the profitability of harvesting ocean quahogs.

- In 2001 new life was breathed into the ocean quahog fishery, sparked by a sharp increase in ex-vessel prices and the improved efficiency of large, newly constructed vessels. Landings jumped approximately 17%, followed by a 5% increase in both 2002 and 2003.

- In 2004 the ocean quahog fishery started into another decline. As mentioned previously, industry elected to reduce production of the lower-valued ocean quahogs first, and followed with surfclam production cutbacks only when it became clear there was no other choice.

- In 2005 the impacts of the crisis were most strongly felt. The federal quota had been newly increased to 5.333 million bushels, however at year's end, 45% had been left unharvested. This was the largest percentage surplus on record.

- A total of 15 vessels participated in the ocean quahog fishery in 2009, a decrease of three vessels from 2008, and far below the 29 vessels that participated in 2004. The consolidation of the fishery into fewer hands is evident when one notes that just four large vessels accounted for over 50% of the federal ocean quahog harvest in each of the past several years.

- Of the 5.333 million bushel quota for 2009, 4,540 bushels were leased to the Maine fishery, and 3.434 million harvested by the industrial fishery outside of Maine.

- The average ex-vessel price of ocean quahogs reported by processors increased a modest 2.3% from $6.61 to $6.76 per bushel in 2009. Prices ranged from a low of $6.00 to a high of $8.50 per bushel, with the vast majority reported at either $6.50 or $7.00. A large portion of the increase was due to the skyrocketing price of diesel fuel in recent years. The total ex-vessel value of the 2009 federal harvest outside of Maine was approximately $23.0 million or <1% decrease from the prior year.

- Fleet performance statistics suggest that production continues to shift to large vessels fishing longer trips. For example, the average number of ocean quahog trips taken per vessel in 2008 declined from 75 to 66 trips increasing to 75 trips per vessel in 2009. However the average number of hours reported fishing on each trip increased from 21 in 2008 to 22 in 2009. The average number of bushels harvested per trip increased from approximately 88 cages in 2008 to 95 cages in 2009. (Each cage holds 32 bushels.)

- A fleet-wide calculation of LPUE showed that the average number of bushels harvested per hour of fishing increased from 135 in 2008 to 141 in 2009 (Appendix Table 2). In early 2010 the average increased to almost 144 again, though this may be reflecting the fact that only the larger vessels would be able to fish the dense offshore beds in the winter months of January and February (Appendix Figure 2).

- Examination of ocean quahog LPUE over the past 20 years looks something like a roller coaster ride, with many peaks and valleys (Appendix Figure 2). Each 'hill' illustrates the pattern of improving productivity as the fleet moves to a new area of virgin biomass, and each valley the decline in productivity as that area is fished down.

- Harvests of ocean quahogs remained concentrated on the high-yielding degree square off eastern Long Island (4072). Fully 74% of the coastwide harvest was taken from this square in 2006. In 2008 and 2009 the percentage had decreased to 68 and 45% of the total harvest,

respectively. The next most heavily fished areas are the adjacent squares to the east (4071) and southwest off New Jersey (3973) - (Appendix Table 4 and Appendix Figure 4).

- Obtaining the highest catch rate can require traveling a substantial distance offshore, as evidenced by the darkest-colored squares on a map of ocean quahog catch rates by ten-minute square (Appendix Figure 4). Limits on further movement of the fleet to the east were imposed by the closure of surfclam and ocean quahog beds east of the 69° line since 1990, due to the presence of PSP toxin.

- Some fishing for ocean quahogs does persist in the southern waters off Delmarva (3873 and 3874), though catch rates are generally between 50 to 100 bushels per hour (Appendix Table 4).

6.4.5.2. Economic and social environment for EEZ ocean quahogs

Traditionally, the dominant use of ocean quahogs has been in such products as soups, chowders, and white sauces. Their small meat has a sharper taste and darker color than surfclams, which has not permitted their use in strip products or the higher-quality chowders. With their lower ex-vessel price (approximately $7.00 per bushel in 2009 for the full "lease plus harvest" value), ocean quahogs have historically been a bulk, low- priced food item. As in other fisheries such as Atlantic mackerel, the industrial ocean quahog fishery has only been viable when large quantities can be harvested quickly and efficiently. When catch rates fell below a certain point, vessels tend to shift their effort to higher-yielding areas.

Industry utilization of ocean quahogs has varied across the years, influenced by market conditions and the costs of harvesting ocean quahogs. There was a shift toward greater utilization of quahog meats in 1997 and 1998. Both years saw almost all of the quota harvested, while surfclam quota was left unharvested on the ocean floor. However, this trend reverted back to the historical norm in 1999 as fuel prices spiked, and it became relatively more expensive to harvest ocean quahogs which are found farther offshore. Higher fuel prices combined with the increasing scarcity of dense ocean quahog beds resulted in an overall decline in ocean quahog harvests. Industry focus returned to surfclams, and they harvested nearly all of the federal 1999 surfclam quota, while leaving 16% of the ocean quahog quota unharvested.

The trend became even stronger in the year 2000, which saw ocean quahog harvests (apart from Maine) plummet 16% to 3.161 million bushels, a level not seen in two decades. The principal reason behind the fall was not a lack of demand, as demand was strong for both surfclams and ocean quahogs at the time. Declining catch rates combined with low dockside prices and resulted in processors having great difficulty in convincing vessels to fish for them. A resurgence of interest occurred in 2001 as buyers increased prices dramatically to the $6.00 - $7.00 per bushel level, and vessels started moving on to new higher-yielding areas.

Ocean quahog landings continued rising in 2002 and 2003, buoyed by price increases. Then in 2004 an approaching glut in the market for clam meats caused landings to dip, followed by a steep drop in 2005. As described in earlier sections, landings of both surfclams and ocean quahogs fell during the past few years, such that substantial portions of the quota for each species were left unharvested.

6.4.6. Maine Ocean Quahog

6.4.6.1. Fisheries for Maine ocean quahogs

According to 50 CFR Section 648.76 (2)(b)(iv): *The Regional Administrator will monitor the quota based on dealer reports and other available information and shall determine the date when the quota will be harvested. NMFS shall publish notification in the Federal Register advising the public that, effective upon a specific date, the Maine mahogany quahog quota has been harvested and notifying vessel and dealer permit holders that no Maine mahogany quahog quota is available for the remainder of the year.*

It must also be remembered that according to 50 CFR Section 648.76 (2)(b)(iii): *All mahogany quahogs landed by vessels fishing in the Maine mahogany quahog zone for an individual allocation of quahogs under Section 648.70 will be counted against the ocean quahog allocation for which the vessel is fishing.* In other words, even after the initial maximum quota of 100,000 Maine bushels is harvested from the Maine mahogany ocean quahog zone (north of 43° $50^{'}$), vessels could obtain/use ITQ allocation and continue to fish in this zone. It is anticipated that some Maine fishermen will again rent ITQ allocation after the 100,000 bushel quota is reached during the next three years as they have done for many of the past years.

There are two principal fishing grounds for ocean quahogs in Maine waters, the east bed and the west bed, which together cover about 60 nautical square miles. Landing peaked in 2002 at nearly 129,000 bushels and then declined in the following years until rebounding in 2006 (Appendix Table 2). The most productive eastern fishing grounds were reopened by the State of Maine in late 2005 after three years of closure due to PSP contamination.

Fishing effort in Maine waters peaked during 2004 at about 19,000 hours per year and then declined to about 10,000 hours in 2009. Ocean quahogs harvested from Maine waters are small in size compared to those harvested in the EEZ. Ocean quahogs in the Maine fishery range from 1.4 to 2.8 inches, and are marketed in the fresh and half-shell market at relatively high prices.

The small-scale fishery for ocean quahogs in Maine provides a stark contrast to the industrial fishery that occurs off the coast of the mid-Atlantic States up through Massachusetts. Small vessels in the 35-45 ft range actively target smaller ocean quahogs for the fresh, half shell market in Maine. Most of the catch is trucked directly out of Maine and brings an ex-vessel price that ranges from $24 - $40 per Maine bushel.

Fishable biomass in Maine waters in 2005 was estimated to be 36.5 million pounds or 3.3 million Maine bushels. The Maine fishery is small, relative to the rest of the EEZ, and unique. In particular, the Maine fishery exploits relatively small ocean quahogs at a rate where F = 0.02. That fishing mortality is more than double that on the remainder of the exploitable stock.

In 2009 the Maine ocean quahog fleet harvested a total of 55,649 Maine bushels, a 17% decrease from the 66,964 bushels harvested in 2008 (Appendix Table 2). Of the total 2009 harvest, 51,109 bushels were taken from the 100,000 bushel quota for Maine, and 4,540 bushels were leased from the industrial ITQ fishery to the south. Average catch rates have declined from a recent peak of 8.1 bushels per hour in 2006 to 5.7 bushels in 2009. In early 2010 the average increased to over 6 bushels per hour.

Finally, average prices have declined substantially over the past 5 years. In 2003, there were very few trips that sold for less than $37.00 per Maine bushel, and the mean price was $40.66. Aggressive price cutting by one company has driven prices down such that many trips in 2008 and 2009 sold for $28.00, with the mean price for all trips equaling $33.31 per bushel in 2008. With fuel prices soaring in mid-2008, the number of vessels participating in the fishery fell to a total of 22 vessels. In 2009, the mean price was $32.91 per Maine bushel and a total of 19 vessels participated in the fishery; the lowest level of vessels on record in the current data series extending back to 1991.

The value of the 2009 harvest reported by the purchasing dealers totaled approximately $2.0 million, a drop of 15% from the prior year.

The Maine ocean quahog quota has been 100,000 bushels since implementation of Amendment 10 in 1999.

Paralytic Shellfish Poisoning

During nearly every summer since the Council began managing the Maine ocean quahog resource (1999), some of the principal fishing grounds in Maine have been closed due to the presence of PSP. These closures have been important in preventing the quotas from being exceeded because they generally occur when the demand for the resource is highest. The eastern-most beds between Petit Manan Point and Long Point were reopened in October 2005 (Stockwell pers com) for the first time in three years and contributed greatly to the recent increase in LPUE. The commercially active Maine beds were sufficiently free of PSP to remain completely open for all of 2006, and in August 2007 there was one short PSP closure that had minimal impact on the fishery. In both 2008 and 2009, there were significant closures due to PSP in Maine waters (Couture pers comm).

Contamination from PSP has also had a huge impact on the fledgling fisheries for surfclams and ocean quahogs on GBK. These resources were initially closed in 1990 when PSP was found and have remained closed. This area has continued to increase its relative percentage of the biomass for each species and now comprises over 45% of both surfclam and ocean quahog total EEZ biomass. The amount of resources on GBK is very important, as LPUE for surfclams continues to decline in the areas to the west and south of GBK. Both industry and government have been trying to figure a way that these GBK resources can be safely harvested in the future.

The National Ocean Service (NOS) has provided a grant to the Food and Drug Administration (FDA), the States of Maine, New Hampshire, and Massachusetts as well as a clam industry representative to collect water and shellfish samples from federal waters off of southern New England, Gulf of Maine, and Georges Bank. This multi-year project monitors *Alexandrium spp* cell counts in the water column and PSP levels in shellfish along the New England coast and on GBK. Research vessels collect water samples, along with fish and shellfish taken from the ocean floor. A clam vessel collects water and shellfish samples from Nantucket Shoals, Stellwagen Bank, and Georges Bank. The FDA designed the sampling protocol and defined the locations where shellfish samples will be taken.

The FDA's shellfish PSP Protocol has been revised from its original 1995 requirements to incorporate the latest scientific understanding and technology. The FDA and the Interstate Shellfish Sanitation Commission have ratified the Protocol to be tested in a pilot project. The

pilot project was implemented in the spring of 2008. The data from both projects will be used to monitor and better understand the spread of PSP in New England waters.

As of mid-July 2010 the Regional Office of NMFS had develop a Programmatic Environmental Assessment for the reopening of the GBK fisheries for surfclams and ocean quahogs. A proposed rule for reopening a portion of GBK had been published in the *Federal Register* (75 FR 37745; June 30, 2010) with a 30 day comment period. After review of the comments, it is possible that the Cultivator Shoal area of GBK could be reopened in mid to late-summer, depending on whether or not a large *Alexandrium* bloom occurred prior to any proposed openings. *Alexandrium* blooms generally occur in May through July.

6.4.6.2. Economic and social environment for Maine ocean quahogs

Amendment 10 implemented management of the Maine ocean quahog fishery in May 1998. The initial quota was set at 100,000 bushels and has been maintained at that level for every year since. A total of 19 vessels reported landing ocean quahogs in Maine during 2009. These vessels in turn sold their catch to a total of eight dealers.

In general, each vessel has a crew of 3-4 men (including the captain). The crewmembers are generally hired locally. Some crewmembers come and go while others have fished for the same boat (or boat owner) for several years. In general, vessel owners do not have trouble finding good crew, but some report that when they find good, reliable crew, they do what they can to keep them. Many vessels also participate in other fisheries such as lobster, scallops, mussels, urchins, and periwinkles. Several vessels rely solely on ocean quahogs, often because they do not hold permits in other fisheries.

In general, dealers tend to rely on a few "core" vessels and purchase from other vessels on a sporadic basis. Owning vessels is another strategy utilized by several dealers. This ensures them a continuous supply to send to their markets. Most dealers also buy and sell a variety of other fishery products, such as lobsters, scallops, mussels, soft-shelled clams, crabs, and periwinkles.

Generally, the Maine ocean quahog is destined for the fresh, half shell market. The ocean quahogs, therefore, are also trucked to markets, mostly outside of Maine. Some of the ocean quahogs are sent to other dealers in Maine, but most are shipped out of state directly. Several dealers send trucks to different ports to pick up ocean quahogs. There are several local trucking companies that ship the ocean quahogs to market, and some dealers also own their own trucks.

In Jonesport, the center of the fishery, there are four main wharves that handle ocean quahogs, including the public marina. However, several of these simply represent space leased out to vessel owners. The vessel owners hire their own crew and independently handle their own operations. Other vessel owners moor their vessels in other ports and land their vessels at the wharves utilized by the dealers to whom they sell.

7.0 ENVIRONMENTAL CONSEQUENCES - ANALYSIS OF IMPACTS

7.1 Surfclam (*Spisula solidissima)* Quota

7.1.1 Impacts of Preferred Alternative S3 (3.400 Million Bu.) on the Environment

The Council's preferred alternative quotas for 2011, 2012, and 2013 are 3.400 million bushels annually, which is the same quota that has been in effect since 2004. This was a 4.6% increase from the 2003 quota of 3.250 million bushels. This preferred alternative is consistent with the 2009 SAW, which defines the US EEZ stock as not overfished and overfishing is not occurring.

<u>Summary Justification for Surfclam 3.400 Million Bushel Quota Recommendation</u>

At the June 2010 Council meeting, the Council heard extensive public debate on the issue of the surfclam quota and voted nearly unanimously (12 in favor, one against, with the Regional Administrator abstaining) to recommend its third set of three-year quotas to maintain the surfclam level at 3.400 million bushels. The points presented is Section 6.4.4.3 represent the key factors that led the Council to adopt the 3.400 million bushel maximum level for the next three years.

7.1.1.1 Biological impacts

The five most recent biological assessments (from the 1997, 1999, 2002, 2005, and 2008 surveys) indicate the resource is healthy, composed of many age classes, and can safely sustain the maximum harvest levels allowed by the FMP. The F in 2008 associated with a quota of 3.400 million bushels was approximately 0.027, and these same quotas may result in an F in 2011, 2012, and 2013 of about 0.03 which is well below the overfishing definition fishing mortality threshold of 0.15 (Table 4). Fishing rates could be increased significantly (as much as fourfold) with the current estimated biomass, without the resource becoming overfished. However, the OY range of the plan was set nearly 25 years ago based on historical landings which collapsed the fishery in the early 1970s. It is the Council's intent to never allow this resource to become overfished again as it was prior to management.

Under the surfclam overfishing definition recommended by the 2000 SARC, unanimously approved by the Council, and implemented by the Secretary; overfishing for surfclams occurs whenever F exceeds the threshold fishing mortality rate. The threshold fishing mortality rate is F_{MSY}, but reduced in a linear fashion towards zero when stock biomass falls below the biomass threshold value ($\frac{1}{2}B_{MSY}$). The surfclam stock is overfished whenever stock biomass falls below the biomass threshold level. Estimates of fishing mortality and biomass thresholds and the biomass target based on MSY can be expected to change in each assessment as data accumulate and models improve (Table 4).

The pre-SFA (Sustainable Fisheries Act) overfishing definitions for surfclams, as defined in Amendment 9 (MAFMC 1996) needed revision because those definitions were based on a fishing mortality rate that minimizes the potential for recruitment overfishing ($F_{20\%MSP} = 0.18$ for surfclams), rather than an MSY strategy. Section 2.1.4 of Amendment 12 on maximum sustainable yield summarized the history of MSY calculations for surfclams and described how the Council has prevented overfishing in this species for the past thirty years of federal management.

The Council had at least a 10 year supply horizon for surfclams as its policy for annual quota setting for nearly a decade. The overfishing level defined in Amendment 9 was a "threshold" beyond which the long-term productive capability of the stock is jeopardized. It was concluded in Amendment 9 that the Council's quota setting process is more conservative than the rate-based overfishing levels, given the current resource conditions. The Council is no longer focused on the 10-year supply horizon for this species as they are relying on the approved overfishing definition. The Council used these benchmarks for their annual quota setting since the 2000 stock assessments were completed.

It must be remembered that there has been effective management of surfclams for the past 30 years. The Council began management of this resource with the FMP in 1977. (It was the first FMP in the country under the 1976 Magnuson Fishery Conservation and Management Act.) The surfclam resource had collapsed from overfishing (landings plummeted from 96 million pounds in 1974 to 35 million pounds in 1979; Amendment 8 Table 1; MAFMC 1988), and there was serious Council consideration given to closing the fishery for a few years entirely. A low quota was implemented and by the mid 1980s the resource was rebuilt and the quotas were increased to near what they are today. The original FMP had an MSY estimate of 50 million pounds of meats. This is near the top of the FMP's OY range of 58 million pounds.

In summary, the Council has prevented overfishing of this resource for the past 30 years and fully intends to continue doing so.

7.1.1.2 Non-targeted species or bycatch impacts

National Standard 9 requires Councils to consider the bycatch effects of existing and planned conservation and management measures. Bycatch can, in two ways, impede efforts to protect marine ecosystems and achieve sustainable fisheries and the full benefits they can provide to the Nation. First, bycatch can increase substantially the uncertainty concerning total fishing-related mortality, which makes it more difficult to assess the status of stocks, to set the appropriate OY and define overfishing levels, and to ensure that OYs are attained and overfishing levels are not exceeded. Second, bycatch may also preclude other more productive uses of fishery resources.

The term "bycatch" means fish that are harvested in a fishery, but that are not sold or kept for personal use. Bycatch includes the discard of whole fish at sea or elsewhere, including economic discards and regulatory discards, and fishing mortality due to an encounter with fishing gear that does not result in capture of fish (i.e., unobserved fishing mortality). Bycatch does not include any fish that legally are retained in a fishery and kept for personal, tribal, or cultural use, or that enter commerce through sale, barter, or trade.

As Wallace and Hoff (2004) identified, there is minimal bycatch in the fisheries for these two species. The authors examined three of the more recent clam surveys from the NEFSC and found that of the 1,577 tows completed in the three surveys, there were only 210 fish caught, with the little skate making up over half the catch. Surfclams and ocean quahogs comprise nearly 90% of the total number of animals caught in these three surveys when "clappers" (empty clam shells) were counted with the live clams. Only Atlantic sea scallops, representing other commercially desirable invertebrates were caught at 1%. Commercial clam vessels fish cleaner than the scientific surveys gear which has a liner in the dredge in order to collect all animate and inanimate objects encountered.

Based on the conclusions that there is minimal bycatch of clam dredges, the Council has concluded that maintaining the maximum quota for surfclams still minimizes just about any and all impacts to non-targeted species.

7.1.1.3 Habitat impacts

The SFA of 1996 significantly altered the requirement of FMPs to address habitat issues. The SFA contains provisions for the identification and protection of habitat essential to the production of federally-managed species. The Act requires FMPs to identify and describe essential fish habitat (EFH), describe non-fishing and fishing threats to EFH, and to suggest conservation and enhancement measures. It also requires that Councils "minimize the adverse impacts of fishing to the extent practicable." These new habitat requirements, including what is known about clam gear impacts to the bottom, were addressed in Amendment 12 (MAFMC 1999) and in Amendment 13 (MAFMC 2003).

A panel of experts who participated in a 2001 workshop to evaluate the potential habitat impacts of fishing gears used in the Northeast region concluded that there are potentially large, localized impacts of hydraulic clam dredges on the biological and physical structure of sandy benthic habitats (USDC 2002 or Appendix 4 of MAFMC 2003). The Council concluded in Amendment 13 that there may be some adverse effects of clam dredging on EFH, but concurred with the workshop panel that the effects are short term and minimal because the fishery occurs in a relatively small area (compared to the area impacted by scallop dredges or bottom trawls) and primarily in high energy sand habitats. The panel concluded that biological communities would recover within months to years (depending on what species was affected) and physical structure within days in high energy environments to months in low energy environments. The preamble to the EFH Final Rule (50 CFR Part 600) defines temporary impacts as those that are limited in duration and that allow the particular environment to recover without measurable impact.

Because of the potential that the fishery adversely impacts EFH for a number of managed species, eight action alternatives for minimizing those impacts were considered by the Council in Amendment 13. Four closed area alternatives were analyzed for their biological, economic, and social impacts, but given the results of the gear effects analysis (see above), the Council concluded that none of them were necessary or practicable.

In Amendment 13 (MAFMC 2003) it was estimated that roughly 100 square nautical miles of bottom were impacted by clam dredges. Since 2003, the quota has remained nearly constant but landings have not reached the surfclam quota. However, LPUE has been declining (Appendix Table 1), thus increasing the amount of time the hydraulic dredges are in contact with the bottom. It was concluded in Amendment 13 that since these impacts were potentially affecting a relatively small portion of the overall large uniform area of high energy sand along the continental shelf (approximately 54,900 square nautical miles), they could be considered minimal. Additionally, a potential increase of say a 50% in the "footprint" of the fishery (from 100 to 150 square nautical each year) still represents a small fraction of the total EFH area designated for managed species in the region.

Based on the conclusions that the impacts of clam dredges are temporary and minimal, the Council has concluded that maintaining the maximum quota for surfclams minimizes, to the extent practicable, the adverse effects of fishing on EFH as required by Section 303 (a)(7) of the MSA.

7.1.1.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges, which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. In addition, the proposed actions will not increase fishing effort. Clam vessels dredge at very slow speeds, and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery.

7.1.1.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in detail in the Regulatory Impact Review (RIR) sections RIR 7.1.2 and RIR 8.8.2.1. This alternative (status quo) would allow for similar fishing opportunities in 2011-2013 when compared to 2008-2010. It is not anticipated that this alternative would result in similar landings levels as in previous years. In sum, this alternative is expected to result in no change in consumer or producer surplus, or in the average gross value of the harvest. Reporting and compliance coats would not change as a result of the proposed action. As such, no other associated impacts on small entities are anticipated.

7.1.2 Impacts of Alternative S1 (1.850 Million Bu.) on the Environment

The first non-preferred alternative quota for the next three years of the surfclam fishery is 1.850 million bushels. This quota is within the OY range of between 1.850 and 3.400 million bushels as required by the FMP.

7.1.2.1 Biological impacts

A nearly halving of the quota for the next three years could possibly benefit the long-term sustainability of the resource; however, there is the offsetting argument that the resource is not overfished and overfishing is not occurring. The best estimate of the preferred alternative's fishing mortality rates for 2011, 2012, and 2013 is 0.03. A halving of the catch, as indicated with this minimum OY level, would correspond to an F of below 0.02. The fishing mortality threshold is 0.15 and thus, would allow roughly a sevenfold increase over this level before overfishing would occur. The Council would never allow the rate of 0.15 since that would produce landings far in excess of the maximum OY level (the preferred alternative) and likely would result in a resource collapse as occurred prior to management in the mid-1970s.

Even discounting the availability of the resource on GBK, there is sufficient resource in the New Jersey and Long Island stock assessment areas to maintain a quota significantly above this level. The biology of the resource does not warrant constraining the industry to this level at this time.

7.1.2.2 Non-target species or bycatch impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which have minimal bycatch (Wallace and Hoff 2004). Clam vessels dredge at very slow speeds and healthy

animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Potentially, the less the quota, the less any impact would be.

7.1.2.3 Habitat impacts

This alternative may have a somewhat more beneficial effect on bottom habitat than the preferred alternative since fishing effort would potentially be reduced by about 50%. Given the possibility that dredging activity could be reduced to this degree, the decreasing trend in LPUE for surfclams would not counteract the effect of the reduced quota. In fact, the industry is likely to be actually concentrating even more in some high density surfclam habitat as the vessels attempt to maintain high LPUEs. Under the conditions that prevailed in the fishery in 2003, when the quota was 3.25 million bushels, the Council determined that the EFH impacts of the clam dredge fishery were short-term and minimal. The discussion of the preferred alternative (Section 7.1.1.2) details the basis for the Council's decision. The habitat impacts of this alternative, relative to the status quo alternative, would be slightly positive.

7.1.2.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, the less the quota, the less any impact would be.

7.1.2.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in detail in Sections RIR 7.1.3 and RIR 8.8.2.2. In sum, this alternative is expected to result in a significant decrease in both consumer and producer surplus and reduce the average gross value of the harvest per allocation holder by $325,680. For those entities simply renting their allocation, the foregone value would equate to $108,588.

7.1.3 Impacts of Alternative S2 (3.250 Million Bu.) on the Environment

The second non-preferred alternative quota for the 2011, 2012, and 2013 surfclam fishery is the quota from 2003 of 3.250 million bushels, which would be a slight quota decrease from the current level. This quota is within the OY range of between 1.850 and 3.400 million bushels as required by the FMP. This alternative would return the surfclam quota to the level it was in 2003.

7.1.3.1 Biological impacts

A small decrease in quota from the maximum like this would not impact the long-term sustainability of the resource. The fishing mortality associated with this level of quota would be 0.03 as it is with the maximum OY level preferred alternative. With the current level of resource being nearly 2 billion pounds, a small decrease like this is insignificant and not truly detectable on this large of a resource.

7.1.3.2 Non-target species or bycatch impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which have minimal bycatch (Wallace and Hoff 2004). Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Potentially, the less the quota, the less any impact would be.

7.1.3.3 Habitat impacts

Returning to the 2003 quota for the next three years would result in the same minimal level of impacts as occurred in 2003. The decline in surfclam LPUE (Appendix Table 1) that has occurred since Amendment 13 was implemented in 2003 might cause a small increase in bottom contact time, but the gear would still only impact a small fraction of the total EFH area designated for managed species in the region. In fact, the industry may be actually concentrating even more in some high density surfclam habitat as the vessels attempt to maintain high LPUEs. The discussion of the preferred alternative (Section 7.1.1.2) explains the basis for the Council's determination (in 2003) that clam fishing gear impacts are temporary and minimal.

7.1.3.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, the less the quota, the less any impact would be.

7.1.3.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in detail in sections RIR 7.1.4 and RIR 8.8.2.3. In sum, this alternative is expected to result in a slight decrease in both consumer and producer surplus and reduce the average gross value of the harvest per allocation holder by $31,421. For those allocation owners renting their allocation, this would equate to a loss of $10,500.

7.1.4 Impacts of Alternative S4 (No Action - Quota Removed) on the Environment

The third non-preferred alternative quota for the 2011, 2012, and 2013 surfclam fishery is no action, or removal of the quota. This alternative could potentially result in landings that are not within the OY range of between 1.850 and 3.400 million bushels as required by the FMP.

7.1.4.1 Biological impacts

Implementation of this alternative may lead to adverse impacts in the long-term, as overfishing may occur. There were no quotas for the fishery prior to management in the mid-1970s and the resource was overfished.

7.1.4.2 Non-target species or bycatch impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which have minimal bycatch (Wallace and Hoff 2004). Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Potentially, if the quota increased greatly, there could be a slightly larger impact.

7.1.4.3 Habitat impacts

Unlimited fishing would likely impact more than the estimated 100 to 150 square nautical miles currently fished and could result in a "free for all" race to fish. The industry would likely concentrate in areas where high LPUEs occur and even if 50% more effort was expended with this fishery, it is likely that the impacts would still be limited to less than 200 square nautical miles of the overall large uniform area of high energy sand along the continental shelf (approximately 54,900 square nautical miles). Thus, it is expected that even the no action alternative would have no more than minimal or temporary adverse impacts on EFH. The discussion of the preferred alternative (Section 7.1.1.2) explains why the Council concluded that clam fishing gear impacts are temporary and minimal.

7.1.4.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, with the lack of a quota, the greater any potential impact would be.

7.1.4.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in Sections RIR 7.1.5 and RIR 8.8.2.4. In sum, the Mid-Atlantic Council is required by 50 CFR part 648 to recommend annual quotas that fall within the optimum yield range for each species. Failure to make a recommendation within these bounds is not a legal option and would be inconsistent with National Standard 1 of the Magnuson-Stevens Act.

7.2 Surfclam Minimum Size Limit Suspension

The Surfclam and Ocean Quahog FMP includes a provision for a minimum size limit of 4.75 inches on surfclams, which may be used to protect new year classes from harvest before they have reached an optimal size. The provision is written such that a minimum size will automatically be in effect unless the Council and NMFS take the active step of suspending it each year. The size limit was initially implemented because it was believed that the size of 4.75 inches maximized the yield per recruit and because the processors wanted larger clams. Since implementation of the ITQ program, the processors pay a price differential for various size/quality clams and the biology is better known today than it was 30 years ago. Thus, there is not the strong necessity for a

minimum size limit.

Regulations for surfclams require that gear restrictions be applied if the proportion of clams smaller than 4.75 inches landed exceeds 30% of the total landings for the entire coast wide stock. Witzig in a September 2009 report entitled: *Analysis of the proportion of undersized surfclams in coastwide landings for 2009*, identified the data sources and the procedures used in the 2009 evaluation of the size limit suspension. The Witzig report concluded that for January through mid-August 2009, only 6.1% of the surfclam landings were smaller than 4.75 inches.

The current stock is comprised primarily of large, adult individuals, with few small individuals apparent from landings in most areas (USDC 2009b). Reinstating a minimum size under these conditions would result in greater harm than benefit, as it would require the industry to use "sorting" machines which will often damage undersized clams as it routes them back overboard.

It is, therefore, the Council's recommendation that the surfclam minimum size limit be suspended for 20011 2012, and 2013, as has been done every year since 1990. Continuing the suspension will have no impact on the current fishery or resource.

7.2.1 Impacts of Preferred Alternative (Status Quo) on the Environment

7.2.1.1 Biological impacts

There should be no biological impact of the status quo alternative. All clams that are caught are landed resulting in no waste of the resource. The SARC (USDC 2009b) which the Council used in its deliberations considers this resource as not overfished with overfishing not occurring.

7.2.1.2 Non-target species or bycatch impacts

Maintenance of the status quo alternative would result in no change to the non-target species or bycatch impacts from 2010 over the next three years. Suspension of the size limit will result in the least amount of overall fishing effort, and thus, the least amount of any potential impact to the non-target species or bycatch.

7.2.1.3 Habitat impacts

Maintenance of the status quo alternative would result in no change to the essential fish habitat impacts from 2010 over the next three years. Suspension of the size limit will result in the least amount of overall fishing effort, and thus, the least amount of any potential gear impact to the ocean bottom.

7.2.1.4 Protected resources impacts

Maintenance of the status quo alternative will have no different impacts to any protected resource from 2010 over the next three years. Not having a size limit will result in the least amount of overall fishing effort and thus absolutely minimize any potential protected resources impacts.

7.2.1.5 Socioeconomic impacts

As indicated before, the current stock is comprised primarily of large, adult individuals, with few

small individuals apparent from landings in most areas. Reinstating a minimum size under these conditions may result in greater harm than benefit, as it would require the industry to use "sorting" machines which will often damage undersized clams as it routes them back overboard.

Maintenance of the status quo alternative would result in no change to the socioeconomic aspects of the surfclam fishery during the next three years as fishermen will not incur additional costs associated with sorting practices and additional mortality of those small individuals that were returned to the ocean with cracked shells that may eventually die will not occur.

7.2.2 Impacts of Alternative 2 (No Action) on the Environment

7.2.2.1 Biological impacts

The Witzig 2009 report identifies that only 6.1% of the landed clams were smaller than 4.75 inches. It is believed that there is no current at-sea discards. Survival rates of discarded clams is greater than 50%, so even if all the clams smaller than 4.75 inches were discarded, the result would only be about 3% of the annual landings. The 2009 SARC (USDC 2009b) considers this resource in the EEZ as not overfished with overfishing not occurring.

7.2.2.2 Non-target species or bycatch impacts

Discarding 6.1% of the landings would cause more fishing effort. Even though the fishing gear is considered as having only minimal bycatch impacts, there would be more effort required and thus, potentially more of an impact to non-target species.

7.2.2.3 Habitat impacts

Discarding 6.1% of the landings would cause more fishing effort. Even though the fishing gear is considered as having only temporary and minimal impacts, there would be more effort required and thus, potentially more of an impact.

7.2.2.4 Protected resources impacts

Discarding 6.1% of the landings would cause more fishing effort. Even though the fishing gear is considered as having only minimal adverse impacts to protected resources, there would be more effort required and thus, potentially more of an impact.

7.2.2.5 Socioeconomic impacts

Discarding 6.1% of the landings would increase the cost of harvest and result in longer fishing days and more time at-sea for fishermen.

7.3 Ocean Quahog (*Arctica islandica)* Quota

7.3.1 Impacts of Preferred Alternative Q3 (5.333 Million Bu., Status Quo) on the Environment

The Council proposes maintaining the ocean quahog quota for the next three years at 5.333 million bushels. There is no biological reason that the resource can not support this level of quota

given the most recent stock assessments (USDC 1998b, 2000b, 2004, 2007b and 2009a). The 1997 (4.317 million bushels) and 1998 (4.000 million bushels) reductions were based on evaluation of the harvest level which would satisfy the former Council policy of a harvest level that could be maintained for at least 30 years given the information prior to the 1998 assessment (USDC 1998b). The Council currently bases their recommendations on a harvest policy using MSY.

Summary Justification for the Ocean Quahog Quotas to be Maintained During the Next Three Years Recommendation

The points presented in Section 6.4.5.1 represent the key factors that led the Council to adopt the current quota (5.333 million bushels) for the next three years.

7.3.1.1 Biological impacts

Based on the biological data presented in the five most recent assessments (USDC 1998b, 2000b, 2004, 2007b, and 2009a), the ocean quahog quota is not overfished, and overfishing is not occurring. The Council proposes the next three years of ocean quahog quota based on the analysis of abundance for that species found in the 48th Northeast Regional Stock Assessment Workshop concluded in June 2009. Similar to surfclams, SAW 48 and the four previous assessments included work to estimate dredge efficiency and showed a significant increase in the estimate of ocean quahog biomass. Although more than 45% of the resource is located on GBK, SAW 48 did not question whether GBK would ever be reopened. It is estimated that fully 81% of the virgin biomass remains after three decades of harvesting. The stock is still significantly above the MSY biomass reference point.

The Secretary approved Amendment 12 (MAFMC 1999) with its new overfishing definition in April 1999. The new definition has: a “biomass target” = ½ virgin biomass, “fishing mortality target” = $F_{0.1}$, “biomass threshold” = ½ biomass target, and a “fishing mortality threshold” = to $F_{25\%}$ MSP level yielding F = 0.05. The 2008 quota yielded an F of approximately 0.01 compared to the target of 0.03 contained in the overfishing definition. The specific F associated with the quotas for the next three years is expected to be about 0.01. Therefore, the proposed quota is below the approved overfishing definition for fishing mortality.

The Amendment 12 overfishing definition for ocean quahogs is MSY based, since it is generally assumed that MSY for harvested populations occurs at one-half the virgin biomass. The 2008 surveyed biomass estimate (roughly 6 billion pounds of meats) is at about 81% of the virgin biomass (roughly 8 billion pounds of meats), and exploitation rates are below $F_{0.1}$, $F_{25\%}$, and F_{max}. The combination of current biomass and F is highly unlikely to represent overfishing, as defined by the current SFA guidelines (USDC 1998b). There is also, however, significant time to determine the exact nature of the sustainability of the resource, since total removals (which have averaged about 40 million pounds/year) over the past three decades have only reduced the virgin biomass by less than 20%.

The current biomass is less than the likely carrying capacity (K) of the resource, but well above K/2, where MSY is generally considered to occur. Moreover, the current fishing mortality rates are well below existing fishing mortality rate thresholds. Current status of the ocean quahog resource is schematically depicted in Figure 22 of Amendment 13 (MAFMC 2003). Nonetheless, 30 years of harvesting seem to have reduced the population in some areas. It is not yet possible to

characterize the dynamic response of the population to these decreases in density. In many instances, the recruits that might have been produced as a result of prior reductions are only now becoming vulnerable to the survey dredge.

In summary, the Council has prevented overfishing of this resource for the past 30 years and fully intends to continue doing so.

7.3.1.2 Non-targeted species or bycatch impacts

National Standard 9 requires Councils to consider the bycatch effects of existing and planned conservation and management measures. Bycatch can, in two ways, impede efforts to protect marine ecosystems and achieve sustainable fisheries and the full benefits they can provide to the Nation. First, bycatch can increase substantially the uncertainty concerning total fishing-related mortality, which makes it more difficult to assess the status of stocks, to set the appropriate OY and define overfishing levels, and to ensure that OYs are attained and overfishing levels are not exceeded. Second, bycatch may also preclude other more productive uses of fishery resources.

The term "bycatch" means fish that are harvested in a fishery, but that are not sold or kept for personal use. Bycatch includes the discard of whole fish at sea or elsewhere, including economic discards and regulatory discards, and fishing mortality due to an encounter with fishing gear that does not result in capture of fish (i.e., unobserved fishing mortality). Bycatch does not include any fish that legally are retained in a fishery and kept for personal, tribal, or cultural use, or that enter commerce through sale, barter, or trade.

As Wallace and Hoff (2004) identified, there is minimal bycatch in the fisheries for these two species. The authors examined three of the more recent clam surveys from the NEFSC and found that of the 1,577 tows completed in the three surveys, there were only 210 fish caught, with the little skate making up over half the catch. Surfclams and ocean quahogs comprise nearly 90% of the total number of animals caught in these three surveys when "clappers" (empty clam shells) were counted with the live clams. Only Atlantic sea scallops, representing other commercially desirable invertebrates were caught at 1%. Commercial clam vessels fish cleaner than the scientific surveys gear which has a liner in the dredge in order to collect all animate and inanimate objects encountered.

Based on the conclusions that there is minimal bycatch of clam dredges, the Council has concluded that maintaining the quota for ocean quahogs still minimizes just about any and all impacts to non-targeted species.

7.3.1.3 Habitat impacts

The SFA of 1996 significantly altered the requirement of FMPs to address habitat issues. The SFA contains provisions for the identification and protection of habitat essential to the production of federally-managed species. The Act requires FMPs to identify and describe EFH, describe non-fishing and fishing threats to EFH, and suggest conservation and enhancement measures. It also requires that Councils "minimize the adverse impacts of fishing to the extent practicable." These new habitat requirements, including what little is known about clam gear impacts to the bottom, were addressed in Amendment 12 (MAFMC 1999) and Amendment 13 (MAFMC 2003). Amendment 15 that is being drafted now will include EFH updates.

Since Amendment 13 (2003) LPUE for the vessels fishing for ocean quahogs has shown exactly the opposite trend as the surfclam LPUE (Appendix Tables 1 and 2): it was about 20% higher in 2009 than it was in 2003. Landing for ocean quahogs recently have also been below the quota. Thus, bottom time has probably declined in this fishery even though the quota has remained the same since 2005.

The effects on bottom habitat of maintaining the current quota at 5.333 million bushel would be the same or less than they were in 2003 when Amendment 13 was implemented. The gear effects analysis performed for that amendment indicated that the adverse impacts of hydraulic clam dredges are temporary and minimal. The discussion of the preferred alternative for surfclams (section 7.1.1.2) explains the basis for the Council's decision.

7.3.1.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Maintaining the quota should not result in there being interactions/takes of protected resources.

7.3.1.5. Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in Sections RIR 7.2.1 and RIR 8.8.3.1. This alternative (status quo) would allow for similar fishing opportunities in 2011-2013 when compared to 2008-2010. It is not anticipated that this alternative would result in similar landings levels as in previous years. If it is assumed that the industry will not harvest more than 4.000 million bushels of ocean quahogs in 2011, 2012, or 2013; maintaining a quota of 5.333 million bushels, this would result in a surplus of 1.333 million bushels each year. It is further assumed that a surplus of this magnitude will depress ocean quahog rental values to approximately $0.53 per bushel. The unsold quota would then represent a loss in rental income of $706,490.

7.3.2 Impacts of Alternative Q1 (4.000 Million Bu.) on the Environment

The minimum quota allowed under the FMP's OY definition is the alternative for 4.000 million bushels, which was not chosen by the Council because it may be constraining to industry and there is no biological reason to constrain industry at this time. The 4.000 million bushel level is the level the Council selected in 1998 and was a reduction of 7.3% from 1997. With the 1997, 1999, 2002, 2005, and 2008 surveys and the 1998, 2000, 2004, 2007 and 2009 assessments showing that there is sufficient resource, the Council has elected to maintain the current quotas.

The quota reductions which the Council recommended in 1997 and 1998 were in part due to questions about the validity of assuming that all of the GBK biomass would become available to the fishery over the course of the 30 year harvest period. In 1996 when the Council made the assumption of a reopening occurring on GBK, the Council stated that additional quota reductions would be necessary in the future if demonstrable progress was not made toward a reopening of

GBK in the near future. The 1996 SAW did not provide any forecast for ocean quahogs and only provided the management advice that a 30 - year supply is possible only if the biomass on GBK and in areas off Southern New England and Long Island, which are generally too deep to be harvested with current technology, were included.

The 1998, 2000, 2004, 2007, and 2009 SAWs (USDC 1998b, 2000b, 2004, 2007b and 2009a) did not question whether GBK would ever be opened. Fully, more than 40% of the resource is located on GBK. The resource is of sufficient size overall that the 40% that is on GBK is not necessary to meet the Council's former 30-year supply policy. This policy has now been replaced with the overfishing definition which is based on MSY and a supply that is sustainable indefinitely.

As with the surfclam resource, the vast majority of ocean quahogs which are left unharvested in the next three years will still be available to the same allocation holders in subsequent years. Earnings are simply deferred rather than lost, with the ocean quahogs being stored in the ocean.

7.3.2.1 Biological impacts

The 1998, 2000, 2004, 2007, and 2009 SAWs (USDC 1998b, 2000b, 2004, 2007b, and 2009a) did not question whether GBK would ever be opened. Fully more than a third of the resource is located on GBK. The resource is of sufficient size overall that the third that is on GBK is not necessary to meet the Council's former 30-year supply policy. This policy has now been replaced with the overfishing definition which is based on MSY and a supply that is sustainable indefinitely.

This level of quota may have a slight beneficial effect on the resource since major recruitment incidents have not been identified for the ocean quahog stock, and these animals may take up to 20 years to reach marketable size depending upon environmental conditions. However, there are nearly 6 billion pounds of ocean quahogs in the ocean currently, and it seems to make little sense to attempt to significantly reduce the quota.

7.3.2.2 Non-target species or bycatch impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which have minimal bycatch (Wallace and Hoff 2004). Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Potentially, the less the quota, the less any impact would be.

7.3.2.3 Habitat impacts

If this alternative were selected, the ocean quahog quota would be reduced by a third and return to what it was in 1998. A return to the lower quota would have a slightly beneficial effect on bottom habitat since less bottom habitat would be exposed to hydraulic dredging. If it continues, the upward trend in LPUE would further reduce the adverse impacts of the fishery. These impacts, however, have been determined to be short-term and minimal (MAFMC 2003). The discussion of the preferred surfclam alternative (Section 7.1.1.2) explains the basis for the Council's determination.

7.3.2.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, the less the quota, the less any impact would be.

7.3.2.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in sections RIR 7.2.1 and RIR 8.8.3.2. In sum, it is expected that a 20% decrease in the federal ocean quahog quota to 4.000 million bushels would result in little surplus quota, such that rental values for ocean quahog allocation would remain in the neighborhood of $1.00 per bushel.

7.3.3 Impacts of Alternative Q2 (5.000 Million Bu.) on the Environment

This was the quota in 2004 and is midway in the OY range for ocean quahog quotas. Ex-vessel prices may likely rise as supply may become constraining. For 1999, industry requested the Council raise the quota to 4.500 million bushels as that is what they expected to be able to sell in 1999 and, in general, they supported maintaining the status quo for 2000, 2001, 2002, and 2003. They wanted the quota increased gradually beginning in 2005, but by the time they reached 5.333 million bushels in 2005, they recommended staying there. Industry now believes that the quota should be maintained for the next three years at 5.333 million bushels.

7.3.3.1 Biological impacts

Given the current state of the stock, that the ocean quahog resource is “not overfished and overfishing is not occurring”, a slight decrease in quota would not be at all harmful. Harvesting either 50 or 60 million pounds will result in fishing mortality rates of around 0.01 which is below the fishing mortality threshold.

7.3.3.2 Non-target species or bycatch impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which have minimal bycatch (Wallace and Hoff 2004). Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Potentially, the less the quota, the less any impact would be.

7.3.3.3 Habitat impacts

It is difficult to predict what effect a slight reduction in the current quota would have on bottom habitat. Landings of ocean quahogs during the past decade have not approached this possible quota level and thus the quotas have not constrained the landings. If landings remained about the same, the intensity and distribution of dredging would probably also, assuming that the upward trend in LPUE continues. If this trend does not continue, habitat impacts would most likely be the

same as they would be under the slightly higher Alternative Q3 status quo quota. The discussion of the preferred surfclam alternative (Section 7.1.1.2) explains why the Council concluded that clam fishing gear impacts are temporary and minimal.

7.3.3.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, the less the quota, the less any impact would be.

7.3.3.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in Sections RIR 7.2.1 and RIR 8.8.3.3. In sum, reducing the current ocean quahog quota to 5.000 million bushels would result in a surplus of approximately 1.000 million bushels and that rental values for ocean quahog allocation would fall to the vicinity of $0.65 per bushel.

7.3.4 Impacts of Alternative Q4 (6.000 Million Bu.) on the Environment

This is the maximum of the FMP's OY range for ocean quahog quotas and would be a quota increase of 0.666 million bushels above the status quo. Bottom habitat could potentially be slightly negatively impacted as roughly 12% more ocean quahogs could potentially be removed. Ex-vessel prices likely would fall as supply would greatly exceed demand. For 1999, industry requested the Council raise the quota to 4.5 million bushels as that is what they expected to be able to sell in 1999. In addition, they supported maintaining the status quo for 2000, 2001, 2002 and 2003 and believed a slight quota increase to 5 million bushels would be needed in 2004 with additional increases during the next three years; however, they asked the Council to maintain the quota at 5.333 million bushels in 2006 and wish to continue that quota through 2013.

7.3.4.1 Biological impacts

This large of an increase in one year could potentially have some slight biological impact. Annual fishing mortality would likely go from about 1% to more than 1% and thus, would approach the threshold level of overfishing. There are nearly 6 billion pounds of ocean quahogs in the ocean currently, so even fishing at the maximum OY level would not likely effect the long-term sustainability of the resource for the next three years.

7.3.4.2 Non-target species or bycatch impacts

A 12% increase in the current quota level may result in a slightly higher impact on non-target species or bycatch since more animals may be exposed to hydraulic dredging. However, a continued upward trend in LPUE would have a compensating effect on the amount and spatial extent of dredging. As noted previously, the adverse impacts of fishing effort in this fishery were determined to be minimal for bycatch (Wallace and Hoff 2004). Modest increases in the quota would not change that conclusion, especially since landings do not reach the quota.

7.3.4.3 Habitat impacts

A 12% increase in the current quota level may result in a slightly higher impact on bottom habitat since more bottom habitat would be exposed to hydraulic dredging. However, a continued upward trend in LPUE would have a compensating effect on the amount and spatial extent of dredging. As noted previously, the adverse impacts of fishing effort in this fishery were determined to be short-term and minimal in 2003. Modest increases in the quota would not change that conclusion, especially since landings do not reach the quota.

7.3.4.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, the more the quota and thus, the more the fishing, the slightly more the minimal adverse impacts realized.

7.3.4.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in Sections RIR 7.2.1 and RIR 8.8.3.4. In sum, this alternative can be expected to create a massive quota surplus of approximately 2.0 million bushels and drive down the rental value of ocean quahog allocation to the neighborhood of $0.30 per bushel. It is likely that some allocation owners with lesser access to a market would be likely to permanently sell their allocations at discounted prices and result in greater consolidation and less competition in the market.

7.3.5 Impacts of Alternative Q5 (No Action - Quota Removed) on the Environment

The fourth non-preferred alternative quota for the 2011, 2012, and 2013 ocean quahog fishery is no action or removal of the quota. Unlimited harvests could potentially result in landings that are not within the OY range of between 4.000 and 6.000 million bushels as required by the FMP. Although not setting a quota could reasonably result in harvests not within the OY range, it is more likely that fishing would not occur until NMFS established a quota level. This would be due to the inability to issue cage tags, until a quota is established.

7.3.5.1 Biological impacts

Implementation of this alternative may lead to adverse impacts in the long-term, as overfishing may occur. There were no quotas for the ocean quahog fishery prior to management in the mid-1970s. It is likely that without quotas for ocean quahogs that industry would overfish this valuable resource.

7.3.5.2 Non-target species or bycatch impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which have

minimal bycatch (Wallace and Hoff 2004). Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Potentially, if the quota increased greatly, there could be a slightly larger impact.

7.3.5.3 Habitat impacts

Unlimited fishing would likely impact more than the estimated 100 to 120 square nautical miles currently fished and could result in a "free for all" race to fish. The industry would likely concentrate in areas where high LPUEs occur and even if 50% more effort was expended in this fishery, it is likely that the impacts would still be limited to less than 200 square nautical miles of the overall large uniform area of high energy sand along the continental shelf (approximately 54,900 square nautical miles). Thus, it is expected that even the no action alternative would have no more than minimal or temporary adverse impacts on EFH. The discussion of the preferred alternative (Section 7.1.1.2) explains why the Council concluded that clam fishing gear impacts are temporary and minimal.

7.3.5.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, with the lack of a quota, the greater any impact would be.

7.3.5.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in Sections RIR 7.2.2 and RIR 8.8.3.5. In sum, the Mid-Atlantic Council is required by 50 CFR part 648 to recommend annual quotas that fall within the optimum yield range for each species. Failure to make a recommendation within these bounds is not a legal option and would be inconsistent with National Standard 1 of the Magnuson-Stevens Act.

7.4 Maine Ocean Quahog Quota

Four alternative quotas are presented for the Maine ocean quahog fishery. Alternative M3 would maintain the status quo quota at the maximum allowable level of 100,000 Maine bushels.

7.4.1 Impacts of Preferred Alternative M3 (100,000 Bu., Status Quo) on the Environment

The Council recommends that the Maine ocean quahog quota for the next three years remain unchanged at the initial maximum quota of 100,000 Maine bushels (1 bushel = 1.2445 cubic ft).

The Council believes that the 2010 quota will not likely be reached and thus the Regional Administrator will not need to close the fishery in 2010. It is anticipated that the Regional Administrator will likely not have to close the fishery during the next three years as was done in practically all years prior to 2008.

7.4.1.1 Biological impacts

The life history parameters of growth, recruitment and natural mortality are not known precisely and thus, the population dynamics of the resource are poorly understood. However, it would be highly unlikely to expect a change in biological impact from the current levels since the Status Quo alternative remains in effect for the next three years. This past year's ocean quahog assessment reviewed a survey and assessment of this resource by the State of Maine. The Maine assessment was fully accepted by the SARC and now provides stock status for this portion of the ocean quahog resource. There are no known overfishing parameters (either biomass or fishing mortality) for this segment of the resource at this time. The resource seems sustainable with the current quotas.

7.4.1.2 Non-target species or bycatch impacts

Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Maintaining the current status quo will not change this minimal impact.

7.4.1.3 Habitat impacts

There is no information on the habitat effects of the Maine "dry" dredges that are used in this fishery (Stevenson *et al*. 2004). The gear effects analysis in Amendment 13 (MAFMC 2003) did not apply to the Maine ocean quahog fishery, so the effects of different catch quotas -- with their associated levels of effort -- can not be evaluated at this time.

7.4.1.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Maintaining the current status quo will not change this minimal impact.

7.4.1.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in Sections RIR 7.3.1 and RIR 8.8.4.1. This alternative (status quo) would allow for similar fishing opportunities in 2011-2013 when compared to 2008-2010. Given the stability that has been apparent in the Maine fishery in recent years, the Mid-Atlantic Council does not feel there is justification for reducing the Maine quota below the current 100,000 bushel maximum for the coming three-year quota interval. The State of Maine has requested continuance of the 100,000 bushel quota. In sum, maintaining the current Maine ocean quahog quota of 100,000 Maine bushels would result in no change when compared to 2010. Hence, the preferred alternative would have no impact on revenues, compliance costs, or reporting costs for small entities.

7.4.2 Impacts of Alternative M1 (50,000 Bu.) on the Environment

Alternative M1 corresponds to a 50% reduction from the maximum allowable quota under the current management plan. There is no real justification for the halving of the current quota. There are no known overfishing parameters for this segment of the population at this time.

7.4.2.1 Biological impacts

It is unknown if a halving of the quota would change the biological impacts for the next three years. While intuitively a reduction in quota would seem to be beneficial, the life history parameters of growth, recruitment and natural mortality are not known precisely and thus, it is not known if a change in the quota would have a biological impact on the species. Halving the quota would not prevent Maine fishermen from renting IFQ allocation once the Maine ocean quahog quota is reached. Additionally, the ocean quahog fishery overall is not overfished, and overfishing is not occurring.

7.4.2.2 Non-target species or bycatch impacts

Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Potentially, the less the quota, the less any impact would be.

7.4.2.3 Habitat impacts

There is no information on the habitat effects of the Maine "dry" dredges that are used in this fishery (Stevenson *et al*. 2004). Amendment 13 (MAFMC 2003) did not apply to the Maine ocean quahog fishery, so the effects of different catch quotas -- with their associated levels of effort -- can not be evaluated at this time.

7.4.2.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, the less the quota, the less any impact would be.

7.4.2.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in Sections RIR 7.3.2 and RIR 8.8.4.2. In sum, it is assumed that if the Maine quota were reduced by 50% to 50,000 Maine bushels, 90% of the reduction would be replaced by renting allocation from the ITQ fishery. This would equal a total of 45,000 bushels rented, at an estimated $1.00 per bushel, yielding approximately $45,000 in increased costs to the harvesting sector. Divided amongst the 19 active vessels in the fleet, the average cost per vessel would equal $2,368.

7.4.3 Impacts of Alternative M2 (Slight Decrease of 10% - 90,000 Bu.) on the Environment

Alternative M2 corresponds to a 10% reduction from the current status quo quota of 100,000 Maine bushels. It was proposed to provide the Council with an option for a modest change in the direction of the quota should they feel it warranted.

7.4.3.1 Biological impacts

It is unknown if reducing the quota by 10,000 Maine bushels would change the biological impacts, but it is highly unlikely since the quota reduction is so minimal.

7.4.3.2 Non-target species or bycatch impacts

Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Potentially, the less the quota, the less any impact would be.

7.4.3.3 Habitat impacts

There is no information on the habitat effects of the Maine "dry" dredges that are used in this fishery (Stevenson *et al*. 2004). Amendment 13 (MAFMC 2003) did not apply to the Maine ocean quahog fishery, so the effects of different catch quotas -- with their associated levels of effort -- can not be evaluated at this time.

7.4.3.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, the less the quota, the less any impact would be.

7.4.3.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in Sections RIR 7.3.3 and RIR 8.8.4.3. In sum, it is assumed that if the Maine quota were reduced to 90,000 Maine bushels, 90% of the reduction would be replaced by renting allocation from the ITQ fishery. This would equal a total of 9,000 bushels rented, at an estimated $1.00 per bushel, yielding approximately $9,000 in increased costs to the harvesting sector. Divided amongst the 19 active vessels in the fleet, the average cost per vessel would equal $473.

7.4.4 Impacts of Alternative M4 (No Action - Quota Removed) on the Environment

The third non-preferred alternative quota for the 2011, 2012, and 2013 Maine ocean quahog fishery is no quota associated with the no action alternative. No quota would likely result in landings that are not restricted by the 100,000 bushels, as required by the FMP.

7.4.4.1 Biological impacts

Implementation of this alternative may lead to adverse impacts in the long-term, as overfishing may occur. There were no quotas for the Maine ocean quahog fishery prior to management in the mid-1970s. It is likely that without quotas for Maine ocean quahogs that industry would overfish the valuable resource.

7.4.4.2 Non-target species or bycatch impacts

Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and non-target species or bycatch. Potentially, if the quota increased greatly, there could be a slightly larger impact.

7.4.4.3 Habitat impacts

There is no information on the habitat effects of the Maine "dry" dredges that are used in this fishery (Stevenson *et al*. 2004). Amendment 13 (MAFMC 2003) did not apply to the Maine ocean quahog fishery, so the effects of different catch quotas -- with their associated levels of effort -- can not be evaluated at this time.

7.4.4.4 Protected resources impacts

The only gear used for the surfclam and ocean quahog fisheries are clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery. Potentially, the lack of a quota, the greater any impact would be.

7.4.4.5 Socioeconomic impacts

The socioeconomic impacts of this alternative are discussed in Sections RIR 7.3.4 and RIR 8.8.4.4. In sum, the Mid-Atlantic Council is required by 50 CFR part 648 to recommend annual quotas that fall between 17 and 100 thousand bushels. Failure to make a recommendation within these bounds is not a legal option and would be inconsistent with National Standard 1 of the Magnuson-Stevens Act.

7.5 Cumulative Effects Analysis

A cumulative effects analysis (CEA) is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The purpose of CEA is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful. A formal cumulative impact assessment is not necessarily required as part of an Environmental Assessment under NEPA as long as the significance of cumulative impacts has been considered. The following remarks address the significance of the expected cumulative impacts as they relate to the federally managed surfclam and ocean quahog fisheries.

7.5.1 Consideration of the VECs

In Section 6.0 (Description of the Affected Environment), the valued ecosystem components (VECs) that exist within the surfclam and ocean quahog fishery environment are identified. Therefore, the significance of the cumulative effects will be discussed in relation to the VECs listed below.

1. Managed resources (surfclam and ocean quahog)
2. Non-target species
3. Habitat including EFH for the managed resource and non-target species
4. Endangered and protected species
5. Human communities

7.5.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the harvest of surfclam and ocean quahog. The core geographic scope for the managed resource, non-target species, habitat, and endangered and protected resources can be considered the overall range of these VECs in the Western Atlantic Ocean, which is from Maine to North Carolina (Section 6.0). For human communities, the core geographic boundaries are defined as those U.S. fishing communities directly involved in the harvest or processing of the managed resource, which were found to occur in coastal states from Maine to North Carolina (Section 6.4).

7.5.3 Temporal Boundaries

The temporal scope of past and present actions for the managed resource, non-target species, habitat and human communities is primarily focused on actions that have occurred after FMP implementation. For endangered and other protected resources, the scope of past and present actions is on a species-by-species basis (Section 6.4) and is largely focused on the1980s and 1990s through the present, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. The temporal scope of future actions for all five VECs extends about three years (2013) into the future. The temporal scope does not extend beyond three years because the dynamic nature of resource management and lack of information on projects that may occur in the future make it very difficult to predict impacts beyond this timeframe with any certainty.

7.5.4 Actions Other Than Those Proposed in this Document

The impacts of each of the alternatives considered in this specifications document are given in Section 7.1 to 7.4 of this EA. Table 13 presents meaningful past (P), present (Pr), or reasonably foreseeable future (RFF) actions to be considered other than those actions being considered in this document. These impacts are described in chronological order and qualitatively, as the actual impacts of these actions are too complex to be quantified in a meaningful way. When any of these abbreviations occur together (i.e., P, Pr, RFF), it indicates that some past actions are still relevant to the present and/or future actions.

Past and Present Actions

The historical management practices of the Council (described in Section 4.0) have resulted in positive impacts on the health of the surfclam and ocean quahog stocks. Numerous actions have been taken to manage the commercial fisheries for these two species through amendment and framework adjustment actions. In addition, the annual specifications process is intended to provide the opportunity for the Council and NMFS to regularly assess the status of the fishery and to make necessary adjustments to ensure that there is a reasonable expectation of meeting the objectives of the FMP and the targets associated with any rebuilding programs under the FMP. The statutory basis for federal fisheries management is the Magnuson Act. To the degree with which this regulatory regime is complied, the cumulative impacts of past, present, and reasonably foreseeable future federal fishery management actions on the VECs should generally be associated with positive long-term outcomes. Constraining fishing effort through regulatory actions can often have negative short-term socioeconomic impacts. These impacts are usually necessary to bring about long-term sustainability of a given resource, and as such, should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the surfclam and ocean quahog stocks.

Non-fishing activities that introduce chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment pose a risk to all of the identified VECs. Human-induced non-fishing activities tend to be localized in nearshore areas and marine project areas where they occur. Examples of these activities include, but are not limited to: agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities. The overall impact to the affected species and their habitats on a population level is unknown, but likely neutral to low negative, since a large portion of these species have a limited or minor exposure to these local non-fishing perturbations.

In addition to guidelines mandated by the Magnuson Act, NMFS reviews these types of effects through the review process required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by federal, state, and local authorities. The jurisdiction of these activities is in "waters of the U.S." and includes both riverine and marine habitats.

Reasonably Foreseeable Future Actions

In terms of RFF Actions that relate to the federally-managed surfclam and ocean quahog fisheries, only one warrants additional discussion. The development of Amendment 15 to the Atlantic Surfclam and Ocean Quahog FMP is likely to occur in the next three years and would address cost recovery, EFH update, new overfishing definition for ocean quahogs, and excessive shares. Amendment 15 is likely to only have socioeconomic impacts.

In order for many of the proposed non-fishing activities to be permitted under other federal agencies (such as beach nourishment, offshore wind facilities, etc.), those agencies would conduct examinations of potential biological, socioeconomic, and habitat impacts. The Magnuson Act (50 CFR 600.930) imposes an obligation on other federal agencies to consult with the Secretary of

Commerce on actions that may adversely affect EFH. The eight Fishery Management Councils are engaged in this review process by making comments and recommendations on any federal or state action that may affect habitat, including EFH, for their managed species and by commenting on actions likely to substantially affect habitat, including EFH.

In addition, under the Fish and Wildlife Coordination Act (Section 662), "whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under federal permit or license, such department or agency first shall consult with the United States Fish and Wildlife Service, Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular state wherein the" activity is taking place. This act provides another avenue for review of actions by other federal and state agencies that may impact resources that NMFS manages in the reasonably foreseeable future.

In addition, NMFS and the USFWS share responsibility for implementing the ESA. The ESA requires designation of “critical habitat” for any species it lists under the ESA (i.e., areas that contain physical or biological features essential to conservation) and to develop and implement recovery plans for threatened and endangered species. The ESA provides another avenue for NMFS to review actions by other entities that may impact endangered and protected resources whose management units are under NMFS’ jurisdiction.

Table 13. Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the Five VECs.						
Action	**Description**	**Impacts on Managed Resource**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
P, Pr Original FMP and subsequent Amendments and Frameworks to the FMP	Establish commercial management measures	**Direct Positive** Regulatory tool available to manage stocks	**Indirect Positive** Limited fishing effort and reduced race to fish	**Indirect Positive** Limited fishing effort and reduced race to fish	**Indirect Positive** Limited fishing effort and reduced race to fish	**Direct Positive** Benefitted domestic businesses
P, Pr Surfclam and Ocean Quahog Specifications	Establish annual quotas and minimum surfclam size regulations	**Indirect Positive** Regulatory tool to specify annual quotas and regulations; allows response to stock updates	**Indirect Positive** Limited fishing effort	**Indirect Positive** Limited fishing effort	**Indirect Positive** Limited fishing effort	**Indirect Positive** Benefitted domestic businesses
P, Pr, RFF PSP Closed Areas	Reopening of PSP Closed Areas to Clam fishing	**Direct Positive** More surfclams and ocean quahogs will be available	**Indirect Positive** Reduced overall fishing effort	**Indirect Positive** Reduced overall fishing effort	**Indirect Positive** Reduced overall fishing effort	**Indirect Positive** Benefitted domestic businesses
P, Pr Amendment 15 to the FMP (circa 2013)	Cost recovery and definition for excessive shares	**Neutral** Will not affect distribution of effort	**Neutral** Will not affect distribution of effort	**Neutral** Will not affect distribution of effort	**Neutral** Will not affect distribution of effort	**Direct Negative** Will impose additional costs on industry
P, Pr, RFF Agricultural runoff	Nutrients applied to agricultural land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource
P, Pr, RFF Port maintenance	Dredging of coastal port and harbor areas for port maintenance	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects

Table 13 (Continued). Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the Five VECs.

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
P, Pr, RFF Offshore disposal of dredged materials	Disposal of dredged materials	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource viability
P, Pr, RFF Beach nourishment	Offshore mining of sand for beaches and placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for mining companies, negative for fishing industry and beachgoers like sand
P, Pr, RFF Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for some interests, potential displacement for others
P, Pr, RFF Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Potentially Direct Negative** Reduced habitat quality	**Uncertain – Likely Direct Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
RFF National Offshore Aquaculture Act of 2007	Bill that would grant DOC authority to issue permits for offshore aquaculture in federal waters	**Potentially Indirect Negative** Localized decreases in habitat quality possible	**Potentially Indirect Negative** Localized decreases in habitat quality possible	**Direct Negative** Localized decreases in habitat quality possible	**Potentially Indirect Negative** Localized decreases in habitat quality possible	**Uncertain -- Likely Mixed** Costs/benefits remain unanalyzed

Table 13 (Continued). Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the Five VECs.						
Action	**Description**	**Impacts on Managed Resource**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
RFF Offshore Wind Energy Facilities (within 5 years)	Construction of wind turbines to harness electrical power (several facilities proposed from ME through NC	**Uncertain -- Likely Indirect Negative** Dependent on mitigation effects	**Uncertain -- Likely Indirect Negative** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible	**Uncertain -- Likely Indirect Negative** Dependent on mitigation effects	**Uncertain -- Likely Mixed** Dependent on mitigation effects
RFF Liquified Natural Gas (LNG) terminals (within 5 years)	Transportation of natural gas via tanker to terminals located offshore and onshore (several LNG terminals are propose, including RI, NY, NJ and DE	**Uncertain -- Likely Indirect Negative** Dependent on mitigation effects	**Uncertain -- Likely Indirect Negative** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible	**Uncertain -- Likely Indirect Negative** Dependent on mitigation effects	**Uncertain -- Likely Mixed** Dependent on mitigation effects
RFF Convene Atlantic Trawl Gear Take Reduction Team	Recommend measures to reduce mortality and injury to marine mammals	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce bycatch	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues
RFF Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within the next 5 years)	May recommend strategies to prevent the bycatch of sea turtles in commercial fisheries operations	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce bycatch	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues

7.5.5 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative effects, the additive and synergistic effects of the proposed action, as well as past, present, and future actions, must be taken into account.

7.5.5.1 Managed resources

Those past, present, and reasonably foreseeable future actions, whose effects may impact the managed resource and the direction of those potential impacts, are summarized in Table 14. The indirectly negative actions described in Table 14, which include offshore disposal of dredged materials, beach nourishment, marine transportation, and the National Offshore Aquaculture Act of 2007, are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on the managed resources are expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of the managed resources is unquantifiable. As described above (Section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on the managed resources. It is anticipated that the future management actions, described in Table 14, will result in additional indirect positive effects on the managed resources through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services.

The specifications of annual TALs for both of the managed resources supports the long-term sustainability of the surfclam and ocean quahog stocks and is consistent with the objectives of the FMP under the guidance of the Magnuson Act. The impacts from annual specification measures established in previous years on the managed resources are largely dependent on how effective those measures were in meeting their intended objectives and the extent to which mitigating measures were effective. Table 5 illustrates the historical overages, and the fact that there have been no significant overages, for these fisheries. The proposed action in this document would positively reinforce the past and anticipated positive cumulative effects on the surfclam and ocean quahog stocks. However, the proposed action would not have any significant effect on the managed resources individually or in conjunction with other anthropogenic activities (Table 18).

Table 14. Summary of the Effects of Past, Present, and Reasonably Foreseeable Future Actions on the Managed Resources.		
Action	**Past to Present**	**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments and Frameworks to the FMP	Direct Positive	
Atlantic Surfclam and Ocean Quahog Specifications	Direct Positive	
Develop Standardized Bycatch Reporting Methodology	Neutral	
Amendment 15 to the Atlantic Surfclam and Ocean Quahog FMP		Neutral
Agricultural runoff	Indirect Negative	
Port maintenance	Uncertain - Likely Indirect Negative	
Offshore disposal of dredged materials	Indirect Negative	
Beach nourishment - Offshore mining	Indirect Negative	
Beach nourishment - Sand placement	Indirect Negative	
Marine transportation	Indirect Negative	
Installation of pipelines, utility lines and cables	Uncertain - Likely Indirect Negative	
National Offshore Aquaculture Act of 2007		Potentially Indirect Negative
Offshore Wind Energy Facilities (within 5 years)		Uncertain - Likely Indirect Negative
Liquefied Natural Gas (LNG) terminals (within 5 years)		Uncertain - Likely Indirect Negative
Convene Atlantic Trawl Gear Take Reduction Team		Indirect Positive
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 5 years)		Indirect Positive
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on the managed resources** **See section 7.5.5.1 for explanation.**	

7.5.5.2 Non-target species or bycatch

Those past, present, and reasonably foreseeable future actions, whose effects may impact non-target species and the direction of those potential impacts, are summarized in Table 15. The effects of indirectly negative actions described in Table 15, which include offshore disposal of dredged materials, beach nourishment, marine transportation, and the National Offshore Aquaculture Act of 2007, are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on non-target species is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of non-target resources and the oceanic ecosystem is unquantifiable. As described above (Section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. At this time, NMFS can consider impacts to non-target species (federally-managed or otherwise) and comment on potential impacts. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources within NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on non-target species. Implementation of a standardized bycatch reporting methodology would have a particular impact on non-target species by improving the methods which can be used to assess the magnitude and extent of a potential bycatch problem. Better assessment of potential bycatch issues allows more effective and specific management measures to be developed to address a bycatch problem. It is not likely that the development of Amendment 15 to the FMP will lead to improvements in how these fisheries deal with bycatch. Any proposed actions would be consistent with the objectives of the FMP and the National Standards, and the amendment document would include an EIS. The EIS will describe the potential impacts for non-target species from the proposed action and therefore, provide an opportunity for NMFS to implement actions which minimize those impacts. It is therefore anticipated that the future management actions, described in Table 15, will result in additional indirect positive effects on non-target species through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services on which the productivity of many of these non-target resources depend. The impacts of these future actions could be broad in scope, and it should be noted the managed resource and non-target species are often coupled in that they utilize similar habitat areas and ecosystem resources on which they depend. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful have had a positive cumulative effect on non-target species.

The specifications of annual TALs for both of the managed resources supports the long-term sustainability of the surfclam and ocean quahog stocks and is consistent with the objectives of the FMP under the guidance of the Magnuson Act. The proposed actions in this document have a neutral impact and would not change the past and anticipated positive cumulative effects on non-target species and thus, would not have any significant effect on these species individually or in conjunction with other anthropogenic activities (Table 15).

Table 15. Summary of the Effects of Past, Present, and Reasonably Foreseeable Future Actions on the Non-target Species.		
Action	**Past to Present**	**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments and Frameworks to the FMP	Indirect Positive	
Atlantic Surfclam and Ocean Quahog Specifications	Indirect Positive	
Develop Standardized Bycatch Reporting Methodology	Neutral	
Amendment 15 to the Atlantic Surfclam and Ocean Quahog FMP		Neutral
Agricultural runoff	Indirect Negative	
Port maintenance	Uncertain - Likely Indirect Negative	
Offshore disposal of dredged materials	Indirect Negative	
Beach nourishment - Offshore mining	Indirect Negative	
Beach nourishment - Sand placement	Indirect Negative	
Marine transportation	Indirect Negative	
Installation of pipelines, utility lines and cables	Uncertain - Likely Indirect Negative	
National Offshore Aquaculture Act of 2007		Potentially Indirect Negative
Offshore Wind Energy Facilities (within 5 years)		Uncertain - Likely Indirect Negative
Liquefied Natural Gas (LNG) terminals (within 5 years)		Uncertain - Likely Indirect Negative
Convene Atlantic Trawl Gear Take Reduction Team		Indirect Positive
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 5 years)		Indirect Positive
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on the non-target species.** **See section 7.5.5.2 for explanation.**	

7.5.5.3 Habitat

Those past, present, and reasonably foreseeable future actions, whose effects may impact habitat (including EFH) and the direction of those potential impacts, are summarized in Table 16. The direct and indirect negative actions described in Table 16, which include offshore disposal of dredged materials, beach nourishment, marine transportation, offshore wind energy facilities, LNG terminals, and the National Offshore Aquaculture Act of 2007, are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on habitat is expected to be limited due to a lack of exposure to habitat at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on habitat and EFH is unquantifiable. As described above (section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources and the habitat on which they rely prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of direct and indirect negative impacts those actions could have on habitat utilized by resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on habitat and EFH. The actions have constrained fishing effort at a large scale, which should reduce habitat impacts. As required under these FMP actions, EFH was designated for the managed resources. It is anticipated that the future management actions, described in Table 16, will result in additional direct or indirect positive effects on habitat through actions which protect EFH for federally-managed species and protect ecosystem services on which these species' productivity depends. These impacts could be broad in scope. All of the VECs are interrelated; therefore, the linkages among habitat quality and EFH, managed resources and non-target species productivity, and associated fishery yields should be considered. For habitat and EFH, there are direct and indirect negative effects from actions which may be localized or broad in scope; however, positive actions that have broad implications have been, and it is anticipated will continue to be, taken to improve the condition of habitat. There are some actions, which are beyond the scope of NMFS and Council management such as coastal population growth and climate changes, which may indirectly impact habitat and ecosystem productivity. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to habitat have had a neutral to positive cumulative effect.

The specifications of annual TALs for both of the managed resources supports the long-term sustainability of the surfclam and ocean quahog stocks and is consistent with the objectives of the FMP under the guidance of the Magnuson Act. The proposed actions in this document would not change the past and anticipated cumulative effects on habitat and thus, would have no adverse impacts on habitat individually or in conjunction with other anthropogenic activities (Table 16).

Table 16. Summary of the Effects of Past, Present, and Reasonably Foreseeable Future Actions on the Habitat.		
Action	**Past to Present**	**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments and Frameworks to the FMP	Indirect Positive	
Atlantic Surfclam and Ocean Quahog Specifications	Indirect Positive	
Develop Standardized Bycatch Reporting Methodology	Neutral	
Amendment 15 to the Atlantic Surfclam and Ocean Quahog FMP		Neutral
Agricultural runoff	Direct Negative	
Port maintenance	Uncertain - Likely Indirect Negative	
Offshore disposal of dredged materials	Direct Negative	
Beach nourishment - Offshore mining	Direct Negative	
Beach nourishment - Sand placement	Direct Negative	
Marine transportation	Direct Negative	
Installation of pipelines, utility lines and cables	Direct Negative	
National Offshore Aquaculture Act of 2007		Direct Negative
Offshore Wind Energy Facilities (within 5 years)		Potentially Direct Negative
Liquefied Natural Gas (LNG) terminals (within 5 years)		Potentially Direct Negative
Convene Atlantic Trawl Gear Take Reduction Team		Indirect Positive
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 5 years)		Indirect Positive
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, neutral to positive impacts on the habitat.** **See section 7.5.5.3 for explanation.**	

7.5.5.4 Protected and endangered species

Those past, present, and reasonably foreseeable future actions, whose effects may impact the protected resources and the direction of those potential impacts, are summarized in Table 17. The indirectly negative actions described in Table 17, which include offshore disposal of dredged materials, beach nourishment, marine transportation, and the National Offshore Aquaculture Act of 2007, are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on protected resources, relative to the range of many of the protected resources, is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on protected resources either directly or indirectly is unquantifiable. As described above (Section 7.5.4), NMFS has several means, including ESA, under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' protected resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on protected resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on protected resources through the reduction of fishing effort (potential interactions). It is anticipated that the future management actions, specifically those recommended by the Atlantic Trawl Gear Take Reduction Team and the development of strategies for sea turtle conservation described in Table 17, will result in additional indirect positive effects on the protected resources. These impacts could be broad in scope. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to protected resources have had a positive cumulative effect.

The specifications of annual TALs for both of the managed resources supports the long-term sustainability of the surfclam and ocean quahog stocks and is consistent with the objectives of the FMP under the guidance of the Magnuson Act. The proposed actions in this document would not change the past and anticipated cumulative effects on protective resources and thus, would not have any significant effect on protected resources individually or in conjunction with other anthropogenic activities (Table 17).

Table 17. Summary of the Effects of Past, Present, and Reasonably Foreseeable Future Actions on the Protected Resources.		
Action	**Past to Present**	**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments and Frameworks to the FMP	Indirect Positive	
Atlantic Surfclam and Ocean Quahog Specifications	Indirect Positive	
Develop Standardized Bycatch Reporting Methodology	Neutral	
Amendment 15 to the Atlantic Surfclam and Ocean Quahog FMP		Neutral
Agricultural runoff	Indirect Negative	
Port maintenance	Uncertain - Likely Indirect Negative	
Offshore disposal of dredged materials	Indirect Negative	
Beach nourishment - Offshore mining	Indirect Negative	
Beach nourishment - Sand placement	Indirect Negative	
Marine transportation	Indirect Negative	
Installation of pipelines, utility lines and cables	Uncertain - Likely Indirect Negative	
National Offshore Aquaculture Act of 2007		Potentially Indirect Negative
Offshore Wind Energy Facilities (within 5 years)		Unknown
Liquefied Natural Gas (LNG) terminals (within 5 years)		Uncertain - Likely Indirect Negative
Convene Atlantic Trawl Gear Take Reduction Team		Indirect Positive
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 5 years)		Indirect Positive
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on the protected resources.** **See section 7.5.5.4 for explanation.**	

7.5.5.5 Human communities

Those past, present, and reasonably foreseeable future actions, whose effects may impact human communities and the direction of those potential impacts, are summarized in Table 18. The indirectly negative actions described in Table 18, which include offshore disposal of dredged materials, beach nourishment, marine transportation, and the National Offshore Aquaculture Act of 2007, are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on human communities is expected to be limited in scope. It may, however, displace fishermen from project areas. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude. This may result in indirect negative impacts on human communities by reducing resource availability; however, this effect is unquantifiable. As described above (Section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact human communities which are sustained by NMFS' resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on human communities that rely on NMFS' resources for their income and livelihood.

Past fishery management actions taken through the FMP and annual specification process have had both positive and negative cumulative effects by benefitting domestic fisheries through sustainable fishery management practices, while at the same time potentially reducing the availability of the resource to all participants. Sustainable management practices are, however, expected to yield broad positive impacts to fishermen, their communities, businesses, and the nation as a whole. It is anticipated that the future management actions, described in Table 18, will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on the human communities could occur through management actions that will incur costs for the fishermen. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had an overall positive cumulative effect.

The specifications of annual TALs for both of the managed resources supports the long-term sustainability of the surfclam and ocean quahog stocks and is consistent with the objectives of the FMP under the guidance of the Magnuson Act. The impacts from annual specification measures established in previous years on the managed resources are largely dependent on how effective those measures were in meeting their intended objectives and the extent to which mitigating measures were effective. Table 5 described the history of these fisheries. There have been no significant overages in these fisheries.

Overall, the proposed actions in this document would not change the past and anticipated cumulative effects on human communities and thus, would not have any significant effect on human communities individually, or in conjunction with other anthropogenic activities (Table 18).

Table 18. Summary of the Effects of Past, Present, and Reasonably Foreseeable Future Actions on Human Communities.		
Action	**Past to Present**	**Reasonably Foreseeable Future**
Original FMP and subsequent Amendments and Frameworks to the FMP	Direct Positive	
Atlantic Surfclam and Ocean Quahog Specifications	Direct Positive	
Develop Standardized Bycatch Reporting Methodology	Neutral	
Amendment 15 to the Atlantic Surfclam and Ocean Quahog FMP		Potentially Negative
Agricultural runoff	Indirect Negative	
Port maintenance	Uncertain - Likely Indirect Negative	
Offshore disposal of dredged materials	Indirect Negative	
Beach nourishment - Offshore mining	Mixed	
Beach nourishment - Sand placement	Mixed	
Marine transportation	Mixed	
Installation of pipelines, utility lines and cables	Uncertain - Likely Indirect Negative	
National Offshore Aquaculture Act of 2007		Uncertain - Likely Indirect Negative
Offshore Wind Energy Facilities (within 5 years)		Uncertain - Likely Indirect Negative
Liquefied Natural Gas (LNG) terminals (within 5 years)		Uncertain - Likely Indirect Negative
Convene Atlantic Trawl Gear Take Reduction Team		Indirect Negative
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 5 years)		Indirect Negative
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on the human communities.** **See section 7.5.5.5 for explanation.**	

7.5.6 Preferred Action on all the VECs

The Council has identified its preferred action alternatives in section 5.0 of this EA. The cumulative effects of the range of actions considered in this document can be considered to make a determination if significant cumulative effects are anticipated from the preferred action.

Table 19. Magnitude and Significance of the Cumulative Effects; the Additive and Synergistic Effects of the Proposed Action, as well as Past, Present, and Future Actions.

VEC	Status in 2010	Net Impact of P, Pr, and RFF Actions	Impacts of the Proposed Action	Significant Cumulative Effects
Managed Resource	Complex and variable (section 6.1)	Positive (sections 7.5.4 and 7.5.5.1)	Neutral to positive (sections 7.1, 7.2, 7.3 and 7.4)	NONE
Non-target Species	Complex and variable (section 6.1)	Positive (sections 7.5.4 and 7.5.5.2)	Neutral (sections 7.1, 7.2, 7.3, and 7.4)	NONE
Habitat	Complex and variable (section 6.2)	Neutral to positive (section 7.5.4 and 7.5.5.3)	Neutral (sections 7.1, 7.2, 7.3, and 7.4)	NONE
Protected Resources	Complex and variable (section 6.3)	Positive (section 7.5.4 and 7.5.5.4)	Neutral (sections 7.1, 7.2, 7.3, and 7.4)	NONE
Human Communities	Complex and variable (section 6.4)	Positive (section 7.5.4 and 7.5.5.5)	Neutral (sections 7.1, 7.2, 7.3, and 7.4)	NONE

The direct and indirect impacts of this proposed action on the VECs are described in Sections 7.1 through 7.4 of this EA. The magnitude and significance of the cumulative effects, which include the additive and synergistic effects of the proposed action, as well as past, present, and future actions, have been taken into account throughout this section 7.5. The action proposed in this annual specifications document builds off action taken in the original FMP and subsequent amendments and framework documents. When this action is considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative. Based on the information and analyses presented in these past FMP documents and this document, there are no significant cumulative effects associated with the action proposed in this document.

8.0 APPLICABLE LAW

8.1 Magnuson-Stevens Fishery Conservation and Management Act

Section 301(a) of the Magnuson Act states: "Any fishery management plan prepared, and any regulation promulgated to implement such plan pursuant to this title shall be consistent with the following National Standards for fishery conservation and management." The following is a discussion of the National Standards and how this action meets them.

8.1.1 National Standard 1 - Overfishing Definition

"Conservation and management measures shall prevent overfishing while achieving, on a continuous basis, the optimum yield from each fishery for the United States fishing industry."

The Sustainable Fisheries Act (SFA) of 1996, which reauthorized and amended the Magnuson Act made a number of changes to the existing National Standards. With respect to National Standard 1, the SFA imposed new requirements concerning definitions of overfishing in U.S. fishery management plans. In order to comply with National Standard 1, the SFA requires that each Council FMP define overfishing as a rate or level of fishing mortality that jeopardizes a fisheries capacity to produce maximum sustainable yield (MSY) on a continuing basis and defines an overfished stock as a stock size that is less than a minimum biomass threshold.

The SFA also requires that each FMP specify objective and measurable status determination criteria for identifying when stocks or stock complexes covered by the FMP are overfished. To fulfill the requirements of the SFA, status determination criteria are comprised of two components: 1) a maximum fishing mortality threshold and 2) a minimum stock size threshold. The maximum F threshold is specified as F_{msy}. The minimum biomass threshold is specified as ½ the MSY level. The overfishing definition for ocean quahogs was modified and approved in Amendment 12 while the overfishing definition for surfclams was approved in Amendment 13 to comply with the SFA (Table 4). All of the quotas proposed under the preferred alternatives for the 2011, 2012, and 2013 specifications are consistent with overfishing definitions adopted in Amendments 12 and 13. Therefore, the proposed action is consistent with National Standard 1.

8.1.2 National Standard 2 - Scientific Information

"Conservation and management measures shall be based upon the best scientific information available."

The analyses in this proposed action are based on the best scientific information available. The quotas are based upon the 2009 SAWs which found that the resources are not overfished and overfishing is not occurring. Therefore, this action is consistent with National Standard 2.

8.1.3 National Standard 3 - Management Units

"To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination."

Each species in the management unit of this FMP is managed as a single unit throughout its range in the EEZ, from Maine through North Carolina. The proposed action does not alter the management unit. Therefore, this proposed action is consistent with National Standard 3.

8.1.4 National Standard 4 - Allocations

"Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and © carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges."

This proposed action is not expected to significantly alter the allocation of any of the resources managed under this FMP. Therefore, the proposed actions are consistent with National Standard 4.

8.1.5 National Standard 5 - Efficiency

"Conservation and management measures shall, where practicable, consider efficiency in the utilization of the fishery resources; except that no such measure shall have economic allocation as its sole purpose."

The management program implemented by the Amendments to the Surfclam and Ocean Quahog FMP is intended to allow the fisheries managed pursuant to this FMP to operate at the lowest possible cost (e.g., fishing effort, administration, and enforcement) given the FMP's objectives. The measures proposed place no restrictions on processing, or marketing and no unnecessary restrictions on the use of efficient techniques of harvesting. Therefore the proposed actions are consistent with National Standard 5.

8.1.6 National Standard 6 - Variations and Contingencies

"Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches."

The description of how this National Standard is met by the FMP was described in Amendments 8, 10, 12, and 13. All of the other measures proposed allow for consideration in variations among, and contingencies in, fisheries, fishery resources and catches. Therefore, the proposed action is consistent with National Standard 6.

8.1.7 National Standard 7 - Cost and Benefits

"Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication."

The description of how this National Standard is met by the FMP was described in Amendments 8, 10, 12, and 13. This proposed action is not expected to alter the costs of management under this FMP. Therefore, there is no reason to alter the conclusion that the proposed action is consistent with National Standard 7.

8.1.8 National Standard 8 - Communities

"Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities."

National Standard 8 requires that management measures take into account the fishing communities. For Amendment 13 (MAFMC 2003) to this FMP, the Council hired Dr. Bonnie McCay and her associates from Rutgers University to describe the ports and communities that are associated with the surfclam and ocean quahog fisheries. Communities from Maine to Virginia are involved in the harvesting and processing of surfclams and ocean quahogs (section 4.2 of Amendment 13; MAFMC 2003).

The proper management of the stock complexes managed under this FMP through implementation of the management measures described in recent Amendments have been beneficial to the commercial fishing communities of the Atlantic Coast. By preventing overfishing of the stocks and overcapitalization of the industry, positive benefits to the fishing communities have and will continue to be realized. Therefore, the proposed action is consistent with National Standard 8.

8.1.9 National Standard 9 - Bycatch

"Conservation and management measures shall, to the extend practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch."

This national standard requires Councils to consider the bycatch effects of existing and planned conservation and management measures. Bycatch can, in two ways, impede efforts to protect marine ecosystems and achieve sustainable fisheries and the full benefits they can provide to the Nation. First, bycatch can increase substantially the uncertainty concerning total fishing-related mortality, which makes it more difficult to assess the status of stocks, to set the appropriate OY and define overfishing levels, and to ensure that OYs are attained and overfishing levels are not exceeded. Second, bycatch may also preclude other more productive uses of fishery resources.

The term "bycatch" means fish that are harvested in a fishery, but that are not sold or kept for personal use. Bycatch includes the discard of whole fish at sea or elsewhere, including economic discards and regulatory discards, and fishing mortality due to an encounter with fishing gear that does not result in capture of fish (i.e., unobserved fishing mortality). Bycatch does not include any fish that legally are retained in a fishery and kept for personal, tribal, or cultural use, or that enter commerce through sale, barter, or trade. Bycatch does not include fish released alive under a recreational catch-and-release fishery management program. A catch-and-release fishery management program is one in which the retention of a particular species is prohibited. In such a program, those fish released alive would not be considered bycatch.

As Wallace and Hoff (2004) identified, there is minimal bycatch in the fisheries for these two species. The authors examined three of the more recent clam surveys from the NEFSC and found that of the 1,577 tows completed in the three surveys, there were only 210 fish caught, with the little skate making up over half the catch. Surfclams and ocean quahogs comprise nearly 90% of

the total number of animals caught in these three surveys when "clappers" (empty clam shells) were counted with the live clams. Only Atlantic sea scallops, representing other commercially desirable invertebrates were caught at 1%. Commercial clam vessels fish cleaner than the scientific surveys gear which has a liner in the dredge in order to collect all animate and inanimate objects encountered.

8.1.10 National Standard 10 - Safety at Sea

"Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea."

The proposed action should not affect the vessel operating environment, gear loading requirements or create derby style fisheries for Atlantic surfclams or ocean quahogs. The Council developed this FMP and subsequent amendments with the consultation of industry advisors to help ensure that this was the case. In summary, the Council has concluded that the proposed action will not impact or affect the safety of human life at sea. Therefore the action is consistent with National Standard 10.

In general, the setting of the surfclam and ocean quahog quotas, as well as, the suspension of the surfclam minimum size limit is being done in full conformance with the FMP and that the most recent amendment to the FMP (Amendment 13; MAFMC 2003) was found to be in compliance with the Magnuson Act. Nothing in this action would change the FMP/Amendment findings regarding that compliance.

8.2 NEPA

Finding of No Significant Impact (FONSI)

National Oceanic and Atmospheric Administration Administrative Order 216-6 contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity". Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQs context and intensity criteria.
These include:

1) *Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action*?

None of the proposed specifications for the next three years are expected to jeopardize the sustainability of any target species affected by the action. All of the final quota specifications under the preferred alternatives for each species are consistent with the FMP overfishing definitions. This action will protect the long-term sustainability of the surfclam and ocean quahog stocks.

2) *Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species*?

The proposed action is not expected to jeopardize the sustainability of any non-target species (sections 7.1.1, 7.2.1, 7.3.1, and 7.4.1 of this document). The proposed measures maintain the quota specifications for surfclams, ocean quahogs and Maine ocean quahogs for the next 3 years. Therefore, none of these specifications are expected to result in increased fishing effort. In addition, none of the measures are expected to alter fishing methods or the temporal and/or spatial distribution of fishing activities. Therefore, none of the proposed actions are expected to jeopardize the sustainability of non-target species relative to the 2010 specifications.

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson Act and identified in FMPs?

The area affected by the proposed specifications in the surfclam and ocean quahog fisheries has been identified as EFH for: Northeast Multispecies; Atlantic Sea Scallop; Summer Flounder, Scup, and Black Sea Bass; Atlantic Mackerel, Squid, and Butterfish; Bluefish; Atlantic Billfish; and Atlantic Tunas, Swordfish and Shark Fishery Management Plans. The preferred alternatives for the 2011, 2012, and 2013 specifications will have no more than minimal or temporary adverse impacts on EFH.

4) Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?

The proposed action is not expected to have a substantial adverse impact on public health or safety. None of the measures alters the manner in which the industry conducts fishing activities for the target species; therefore, there is no change in fishing behavior that would affect safety. None of the measures has any impact on public health.

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

The specifications for the next three years for ocean quahog and surfclam fishery are not expected to alter fishing methods or activities. Therefore, this action is not expected to affect endangered or threatened species or critical habitat in any manner not considered in previous consultations on the fisheries. It has been determined that fishing activities conducted under this final rule will have no adverse impacts on marine mammals. None of the measures alters fishing methods or activities.

The only gear used for the surfclam and ocean quahog fisheries is clam dredges which are now included in the List of Fisheries for 2010, as a Category III fishery for the taking of marine mammals by commercial fishing operations under Section 114 of the MMPA of 1972. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. As such, minimal interaction is expected between clam dredging gear and protected species. According to the List of Fisheries for 2010, there are no documented interactions/takes in this fishery.

6) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

The proposed action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area because the proposed action measures merely continue for three years catch allowances.

7) Are significant social or economic impacts interrelated with natural or physical environmental effects?

The proposed action is not expected to have a significant social or economic impact. In addition, none of the proposed specifications are expected to alter fishing methods, activities or the spatial and/or temporal distribution of fishing effort. As noted in section 7.0 of the EA, the proposed action is not expected to have any substantial natural or physical effects within the affected area. Therefore, there are no social or economic impacts interrelated with significant natural or physical environmental impacts that are expected.

8) Are the effects on the quality of the human environment likely to be highly controversial?

The proposed measures maintain the specifications for three additional years for the surfclam, ocean quahog, and Maine ocean quahog. The proposed action is based on measures contained in the FMP, which have been in place for many years. In addition, the scientific information upon which the annual quotas are based has been peer reviewed and is the most recent information available. In addition, these measures are strongly favored by the industry. Therefore, the measures contained in this action are not expected to be highly controversial.

9) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

This action proposes to maintain the 2010 specifications for 2011, 2012, and 2013. These fisheries are prosecuted primarily using hydraulic clam dredges in the open ocean throughout the Mid-Atlantic Bight and New England. Most of the fishing effort in these fisheries occurs over featureless sand bottoms along the Atlantic Coast. These fisheries are not known to be prosecuted in any unique areas such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas. Therefore, the proposed action is not expected to have a substantial impact on any of these areas (section 7.0).

10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

This action proposes to continue the 2010 quotas which are in place for 2011, 2012, and 2013. As a result, fishing effort is not expected to increase in magnitude under the proposed action. In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities. As a result, the effects on the human environment of the proposed specifications for 2011, 2012, and 2013 are expected to be

minimal or non-existent compared to the 2010 specifications. The effects on the human environment as a result of implementing the 2011, 2012, and 2013 specifications for these species are not highly uncertain nor do they involve unique or uncertain risks (section 7.0).

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

The impacts of the preferred alternatives on the biological, physical, and human environment are described in section 7.0. The synergistic interaction of improvements in the efficiency of the fishery are expected to generate positive impacts overall. These impacts will be felt most strongly in the social and economic dimension of the environment. Direct economic and social benefits from improved fishery efficiency is most likely to affect participants in these fisheries. These benefits are addressed in the RIR/IRFA of this document. Indirect benefits of the preferred alternatives are likely to affect consumers and in areas of the economic and social environment that interact in various ways with these fisheries. The proposed actions, together with past and future actions are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment.

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

This action proposes to maintain the 2010 specifications for 2011, 2012, and 2013. These fisheries are prosecuted primarily using hydraulic clam dredges in the open ocean throughout the Mid-Atlantic Bight and New England. Most of the fishing effort in these fisheries occurs over featureless sand bottoms along the Atlantic Coast. These fisheries are not known to be prosecuted in any areas that might affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or cause the loss or destruction of significant scientific, cultural or historical resources (section 7.0). Therefore, the proposed action is not expected to affect on any of these areas.

13) Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

These fisheries are prosecuted primarily using hydraulic clam dredges in the open ocean throughout the Mid-Atlantic Bight and New England. There is no evidence or indication that these fisheries have ever resulted in the introduction or spread of nonindigenous species in the past. This action proposes to maintain the 2010 specifications in 2011, 2012, and 2013. As a result, fishing effort is not expected to increase in magnitude under the proposed action. In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities or the spatial and/or temporal distribution of fishing effort significantly (section 7.0). Therefore, it is highly unlikely that the proposed specifications would be expected to result in the introduction or spread of a non-indigenous species.

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

This action proposes to maintain the 2010 specifications for 2011, 2012, and 2013. As a result, fishing effort is not expected to increase in magnitude under the proposed action (section 7.0). In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities or the spatial and/or temporal distribution of fishing effort significantly. Maintaining the 2010 specifications in 2011, 2012, and 2013 is not likely to establish a precedent for future actions. When new stock assessment or other biological information about these species becomes available in the future, then the annual specifications will be adjusted according to the overfishing definitions contained in the FMP.

15) Can the proposed action reasonably be expected to threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment?

This action proposes to continue the 2010 quotas for 2011, 2012, and 2013. As a result, fishing effort is not expected to increase in magnitude under the proposed action. In addition, none of the proposed specifications are expected to substantially alter fishing methods, activities or the spatial and/or temporal distribution of fishing effort significantly. Since no changes are expected to the previous specifications as a result of the proposed action, it is not expected that they would threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment. In fact, the proposed measures have been found to be consistent with other applicable laws (sections 8.3 - 8.11).

16) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

The proposed action is not expected to result in cumulative effects on target or non-target species (section 7.5). The proposed 2011, 2012, and 2013 specifications would maintain the status quo level when compared to 2010 for all three fisheries. As such, the final measures are not expected to result in any cumulative effects on target or non-target species.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for 2011, 2012, and 2013 Atlantic surfclam and ocean quahog fisheries, it is hereby determined that the proposed specifications for 2011, 2012, and 2013 will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

_____ _____

Regional Administrator Date

8.3 Endangered Species Act

The numerous species which inhabit the management unit of this FMP that are afforded protection under the ESA of 1973 (i.e., for those designated as threatened or endangered) are described in section 6.3.

8.4 Marine Mammal Protection Act

The numerous species which inhabit the management unit of this FMP that are afforded protection under the MMPA are described in section 6.3.

8.5 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972, as amended, provides measures for ensuring stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. The Council has developed this specifications document and will submit it to NMFS: NMFS must determine whether this action is consistent to the maximum extent practicable with the CZM programs for each state (Maine through North Carolina).

8.6 Administrative Procedures Act

This Environmental Assessment is in compliance with the Administrative Procedures Act.

8.7 Information Quality Act

Utility of Information Product

Explain how the information product meets the standards for utility:

Is the information helpful, beneficial or serviceable to the intended user?

The proposed document includes the surfclam and ocean quahog specification for 2011, 2012, and 2013 and a description of the alternatives considered and the reasons for selecting the proposed management measures. This proposed specifications document implements the FMP's conservation and management goals consistent with the Magnuson Act, as well as, all other existing applicable laws.

Is the data or information product an improvement over previously available information? Is it more current or detailed? Is it more useful or accessible to the public? Has it been improved based on comments from or interactions with customers?

This proposed specifications document was developed as a result of a multi-stage process that involved review of the source document (2011, 2012, and 2013 specifications package) by affected members of the public. The public had the opportunity to review and comment on management measures during the MAFMC meeting held on June 8, 2010 in New York City. In addition, the public will have further opportunity to comment on this specifications package once NMFS publishes a request for comments notice on the FR.

What media are used in the dissemination of the information? Printed publications? CD-ROM? Internet? Is the product made available in a standard data format? Does it use consistent attribute naming and unit conventions to ensure that the information is accessible to a broad range of users with a variety of operating systems and data needs?

The FR notice that announces the proposed rule and the implementing regulations will be made available in printed publication and on the website for the Northeast Regional Office. The notice provides metric conversions for all measurements.

Integrity of Information Product

Explain how the information product meets the standards for integrity:

All electronic information disseminated by NOAA adheres to the standards set out in Appendix III, "Security of Automated Information Resources," OMB Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

If information is confidential, it is safeguarded pursuant to the Privacy Act and Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business and financial information).

Other/Discussion (e.g., Confidentiality of Statistics of the Magnuson Act; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the MMPA).

Objectivity of Information Product

Indicate which of the following categories of information products apply for this product:

- Original Data
- Synthesized Products
- Interpreted Products
- Hydrometeorological, Hazardous Chemical Spill, and Space Weather Warnings, Forecasts, and Advisories
- Experimental Products
- Natural Resource Plans
- Corporate and General Information

Describe how this information product meets the applicable objectivity standards. (See the DQA Documentation and Pre-Dissemination Review Guidelines for assistance and attach the appropriate completed documentation to this form).

What published standard(s) governs the creation of the Natural Resource Plan? Does the Plan adhere to the published standards? (See the NOAA Sec. 515 Information Quality Guidelines, Section II(F) for links to the published standards for the Plans disseminated by NOAA).

In preparing specifications document, the Council must comply with the requirements of the Magnuson Act, the National Environmental Policy Act, the Regulatory Flexibility Act, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Data Quality Act, and Executive Orders 13132 (Federalism), 12866 (Regulatory Planning), 12630 (Property Rights), and 13158 (Marine Protected Areas).

Was the Plan developed using the best information available? Please explain.

This specification's document has been developed to comply with all applicable National Standards, including National Standard 2. National Standard 2 states that the FMP's conservation and management measures shall be based upon the best scientific information available. Despite current data limitations, the conservation and management measures proposed to be implemented under this specifications document are based upon the best scientific information available. This information includes NMFS dealer weighout, VTR, and logbook data for 2009 which was used to characterize the economic impacts of the management proposals and describe the surfclam and ocean quahog fisheries. The specialists who worked with these data are familiar with the most recent analytical techniques and with the available data and information relevant to the surfclam and ocean quahog fisheries.

Have clear distinctions been drawn between policy choices and the supporting science upon which they are based? Have all supporting materials, information, data and analyses used within the Plan been properly referenced to ensure transparency?

The policy choices (i.e., management measures) proposed to be implemented by this specifications document are supported by the available scientific information and, in cases where information was unavailable, proxy reference points are provided. The management measures contained in the specifications document are designed to meet the conservation goals and objectives of the FMP, and prevent overfishing, while maintaining sustainable levels of fishing effort for to ensure a minimal impact on fishing communities.

The supporting materials and analyses used to develop the measures in the proposed management measures are contained in the specifications document and to some degree on previous specifications and/or FMP as specified in this document.

Describe the review process of the Plan by technically qualified individuals to ensure that the Plan is valid, complete, unbiased, objective and relevant. For example, internal review by staff who were not involved in the development of the Plan to formal, independent, external peer review. The level of review should be commensurate with the importance of the Plan and the constraints imposed by legally enforceable deadlines.

The review process for this specifications package involves the MAFMC, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries headquarters. The Center's

technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, invertebrate resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have the opportunity to provide comments on the specifications document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the specifications document and clearance of the rule is conducted by staff at NMFS Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

8.8 Paperwork Reduction Act

The Paperwork Reduction Act concerns the collection of information. The intent of the Act is to minimize the federal paperwork burden for individuals, small businesses, state and local governments, and other persons as well as to maximize the usefulness of information collected by the federal government. The Council is not proposing measures under this regulatory action that would modify the collection of information under this FMP.

8.9 Impacts of the Plan Relative to Federalism

This action will not duplicate, overlap, or conflict with any other federal rules.

8.10 Environmental Justice

This Executive Order provides that "each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." E.O. 12898 directs each federal agency to analyze the environmental effects, including human health, economic, and social effects of federal actions, including effects on minority populations, low-income populations, and Indian tribes, when such analysis is required by NEPA. Agencies are further directed to "identify potential effects and mitigation measures in consultation with affected communities, and improve the accessibility of meetings, crucial documents, and notices."

The proposed action under the preferred alternative maintains the status quo in terms of participation in the Atlantic surfclam and ocean quahog fisheries. Since the proposed action represents no change relative to the current level of participation in these fisheries, no negative biological, economic, or social effects are anticipated as a result (section 7.0). Therefore, the proposed action under the preferred alternatives are not expected to cause disproportionately high and adverse human health, environmental or economic effects on minority populations, low-income populations, or Indian tribes.

8.11 Regulatory Flexibility Act/ E.O. 12866

This act and executive order are addressed in the Initial Regulatory Flexibility Analysis, which is attached to the end of this document.

9.0 LIST OF AGENCIES AND PERSONS CONSULTED

In preparing these recommendations, the Council consulted with the NMFS, the New England Fishery Management Council, the Fish and Wildlife Service, the Department of State, and the States of New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina through their membership on the Council and the following committees - MAFMC Surfclam/Ocean Quahog and Tilefish Committee, Invertebrate Subcommittee of the SARC, and the Northeast Region EFH Steering Committee.

10.0 LIST OF PREPARERS OF THE ENVIRONMENTAL ASSESSMENT

The majority of the environmental assessment was prepared by Dr. Thomas B. Hoff of the Mid-Atlantic Council staff and is significantly based on information provided by the Northeast Fisheries Science Center through the most recent stock assessments for surfclams and ocean quahogs (USDC 2009a and 2009b). Dr. José L. Montañez of Council staff worked extensively with the economic issues including the RIR, as well as, with the logbook data and their analyses. In addition, Clayton E. Heaton and James L. Armstrong assisted in the creation of some of the tables and figures in this document. The economic analyses in section 4 of Amendment 13, which was used as background information, was conducted by Drs. James Kirkley (VIMS), Rob Hicks (VIMS) and Ivar Strand (University of Maryland) under contract to the Council. The social analyses (section 5) and port and community description (section 2.3.3) of Amendment 13, which was also used as background information for this document, was conducted by a team of researchers from Rutgers University headed by Dr. Bonnie McCay under contract to the Council. The members of Dr. McCay's social team were: Doug Wilson, Teresa Johnson, Kevin St. Martin, Johnelle Lamarque, Eleanor Bochenek, and Giovani Graziosi. In addition, NEFSC scientific personnel, Drs. James Weinberg, Paul Rago, Larry Jacobson, and Steve Murawski have worked extensively on the last ten stock assessments (five each on surfclams and ocean quahogs). Dr. David Stevenson, NERO, provided extensive help on the fishing gear impact section and was one of the individuals mostly responsible for the fishing gear impacts workshop in Boston in October 2001. Finally, Tim Cardiasmenos, NERO, provided extensive guidance throughout the development of this package. Copies of this document can be obtained by contacting Dr. Hoff at the Mid-Atlantic Fishery Management Council, 800 North State Street, Dover, DE 19901; 302-526-5257 or thoff@mafmc.org.

11.0 REFERENCES

American Fisheries Society. 1988. Committee on scientific and vernacular names of mollusks of the Council of Systematic Malacologists. Special Publication 16. Bethesda, MD. 277 p.

Blaylock, R. A., J. W. Hain, L. J. Hansen, D. L. Palka, and G. T. Waring. 1995. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments. NOAA Tech. Mem. NMFS. SEFSC - 363.

Boreman, J. 2010. Report of May 2010 Meeting of the MAFMC Scientific and Statistical Committee. MAFMC. Dover, DE.

Couture, D. Personal communication. Maine Dept. of Marine Resources. West Boothbay Harbor, ME.

Dahl, S. Personal communication. NY Dept. of Environmental Conservation. East Setauket, NY

Davidson, M. Personal communication. NY Dept. of Environmental Conservation. East Setauket, NY.

Hoff, T.B. 2006. Surfclam and ocean quahog management under the Magnuson Act – the first U.S. ITQ system. Presentation to American Fisheries Society national conference. Lake Placid, NY.

Mid-Atlantic Fishery Management Council (MAFMC). 1977. Surfclam and ocean quahog fishery management plan. Dover, DE.

_____. 1979a. Amendment #1 to the surfclam and ocean quahog fishery management plan. Dover, DE.

_____. 1979b. Amendment #2 to the surfclam and ocean quahog fishery management plan. Dover, DE.

_____. 1981. Amendment #3 to the surfclam and ocean quahog fishery management plan. Dover, DE.

_____. 1984. Amendment #5 to the fishery management plan for the Atlantic surfclam and ocean quahog fisheries. Dover, DE.

_____. 1986. Amendment #6 to the fishery management plan for the Atlantic surfclam and ocean quahog fisheries. Dover, DE.

_____. 1987. Amendment #7 to the fishery management plan for the Atlantic surfclam and ocean quahog fisheries. Dover, DE.

_____. 1988. Amendment #8 to the Atlantic surfclam and ocean quahog fishery management plan. Dover, DE.

_____. 1996. Amendment #9 to the Atlantic surfclam and ocean quahog fishery management plan. Dover, DE.

_____. 1998. Amendment #10 to the Atlantic surfclam and ocean quahog fishery management plan. Dover, DE.

____. 1999. Amendment #12 to the Atlantic surfclam and ocean quahog fishery management plan. Dover, DE.

____. 2003. Amendment #13 to the Atlantic surfclam and ocean quahog fishery management plan. Dover, DE.

____. 2006. Framework Adjustment 1 to the Atlantic surfclam and ocean quahog fishery management plan. Dover, DE.

Normant, J. Personal communication. NJ Div. of Fish, Game and Wildlife. Nacote Creek, NJ.

Stevenson, D.H., L. Chiarella, D. Stephan, R. Reid, and M. Pentony. 2004. The effects of fishing on marine habitats of the northeastern United States. NMFS.

Stockwell, T. Personal communication. Maine Dept. of Marine Resources. West Boothbay Harbor, ME.

U.S. Department of Commerce (USDC). 1998a. Report of the 26th Northeast Regional Stock Assessment Workshop (26th SAW), Stock Assessment Review Committee (SARC). NEFSC Ref. Doc. 98-03.

_____. 1998b. Report of the 27th Northeast Regional Stock Assessment Workshop (27th SAW), Stock Assessment Review Committee (SARC). NEFSC Ref. Doc. 98.

_____. 2000a. 30th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc.00-03.

_____. 2000b. 31st Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc.00-15.

_____. 2002. Report of the workshop on the effects of fishing gear on marine habitats of the northeastern United States. NMFS/NERO. Gloucester, MA.

_____. 2003. 37th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc. 03-17.

_____. 2004. 38th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc. 04-04.

_____. 2005. Results from the 2004 cooperative survey of Atlantic surfclams. NEFSC Ref. Doc. 05-01.

_____. 2007a. 43th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc. 07-06.

_____. 2007b. 44th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc. 07-10.

_____. 2009a. 48th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc. 09-09.

_____. 2009b. 49th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc. 10-01.

Vaughn, C. 2008. Clam plant closes, 46 laid off. Delmarvanow.com. May 14, 2008.

Wallace, D.H. and T.B. Hoff. 2004. Minimal bycatch in the Northeast Atlantic surfclam and ocean quahog fishery. *In:* Bycatch in Northeast Fisheries: Moving Forward. NMFS. Gloucester, MA. page 83.

Wallace, D.H. and T.B. Hoff. 2005. Hydraulic clam dredge effects on benthic habitat off the Northeastern United States. American Fisheries Society Symposium 41: 691-694.

Wallace, D.H., T.B. Hoff, R. Savage, and J.C. Bryson. 2005. Criteria for the surfclam and ocean quahog individual transferable quota fishery management system from implementation in 1990 to current (lessons learned). *In:* Managing Our Nation's Fisheries II. Proceedings of a Conference on Fisheries Management in the United States. Washington, D.C. page 253.

Waring, G.T., E. Josephson, C.P. Fairfield, K. Maze-Foley and P.E. Rosel. (eds). 2009 . U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 2009. NOAA Technical Memorandum NMFS-NE-213.

Witzig, J. 2009. Analysis of the proportion of undersized surfclams in coastwide landings for 2009. NERO. 6 pages.

Regulatory Impact Review and Initial Regulatory Flexibility Analysis

1.0 INTRODUCTION

The latest available guidance on the preparation of economic analyses of fisheries regulatory actions can be found in: *Guidelines for Economic Review of National Marine Fisheries Service Regulatory Actions* (NMFS 2007). It provides the following comments on the approach that should be taken to prepare a Regulatory Impact Review (RIR) that is consistent with Executive Order 12866:

> The objective of Executive Order (E.O.) 12866 (58 FR 51735, October 4, 1993) is to improve the federal regulatory system. One of the purposes of the RIR is to comply with the requirements of E.O. 12866. The regulatory philosophy of E.O. 12866 is reflected in the following statements:
>
> Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people. In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages, distributive impacts; and equity), unless a statute requires another regulatory approach.
>
> To ensure that the agencies' regulatory programs are consistent with this philosophy, agencies should adhere to the following principles, to the extent permitted by law and where applicable:
>
> (1) Each agency shall identify the problem that it intends to address (including, where applicable, the failures of private markets or public institutions that warrant new agency action) as well as assess the significance of that problem.
>
> (2) Each agency shall examine whether existing regulations (or other law) have created, or contributed to, the problem that a new regulation is intended to correct and whether those regulations (or other law) should be modified to achieve the intended goal of regulation more effectively.
>
> (3) Each agency shall identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public.
>
> (4) In setting regulatory priorities, each agency shall consider, to the extent reasonable, the degree and nature of the risks posed by various substances or activities within its jurisdiction.
>
> (5) When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. In doing so, each agency shall consider incentives for innovation, consistency, predictability, the costs of enforcement and compliance (to the government, regulated entities, and the public), flexibility, distributive impacts, and equity.
>
> (6) Each agency shall assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs.

(7) Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.

(8) Each agency shall identify and assess alternative forms of regulation and shall, to the extent feasible, specify performance objectives, rather than the behavior or manner of compliance that regulated entities must adopt.

(9) Wherever feasible, agencies shall seek views of appropriate state, local, and tribal officials before imposing regulatory requirements that might significantly or uniquely affect those governmental entities. Each agency shall assess the effects of federal regulations on state, local, and tribal governments, including specifically the availability of resources to carry out those mandates, and seek to minimize those burdens that uniquely or significantly affect such governmental entities, consistent with achieving regulatory objectives. In addition, as appropriate, agencies shall seek to harmonize federal regulatory actions with related state, local, and tribal regulatory and other governmental functions.

(10) Each agency shall avoid regulations that are inconsistent, incompatible, or duplicative with its other regulations or those of other federal agencies.

(11) Each agency shall tailor its regulations to impose the least burden on society, including individuals, businesses of differing sizes, and other entities (including small communities and governmental entities), consistent with obtaining the regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations.

(12) Each agency shall draft its regulations to be simple and easy to understand, with the goal of minimizing the potential for uncertainty and litigation arising from such uncertainty.

Key Elements of the Regulatory Impact Review

The key elements of the RIR for NMFS management actions include –

- A description of the management goals and objectives;
- A description of the fishery and/or other affected entities;
- A statement of the problem;
- A description of each selected alternative, including the 'no action' alternative; and,
- An economic analysis of the expected effects of each selected alternative relative to the baseline.

The issues raised in the above elements will be addressed in detail in the following sections. However it may be of value to stress at the outset that the Individual Transferrable Quota (ITQ) system implemented by Amendment 8 to the Surfclam and Ocean Quahog FMP (MAFMC 1988) in 1990 is in many respects the embodiment of the principals expressed above. It is performance-based in that it directly limits annual harvests to sustainable levels through quotas that allow the industry to operate largely free of constraints that impede efficiency or increase costs.

With the exception of the small Maine ocean quahog fishery, and closures due to the presence of PSP, participants in the Atlantic surfclam and ocean quahog fisheries enjoy exceptional freedom from government interference regarding the time, place, equipment used or manner in which they harvest these animals. There are no closed seasons, trip limits, gear restrictions or effort limitations that existed in the fishery prior to implementation of the ITQ program. Vessels are only required to:

- Limit their harvests to the quantities of clams they have been allocated or rented from others in any given fishing year
- Fasten serialized tags to the metal cages used to transport these animals to allow for an exact accounting of quantities harvested

- Report their landings on government-issued forms, including the serial numbers of cage tags
- Notify NMFS of an upcoming trip prior to departure.

Further streamlining of the regulatory process was instituted with the implementation of Amendment 13 to the FMP, which enabled multi-year quotas with an annual review. Quotas may be adjusted in the second and third years of each three-year interval if necessary, however no regulatory action is required if the annual reviews indicate no change is necessary.

2.0 EVALUATION OF E.O. 12866 SIGNIFICANCE

As part of the RIR, proposed actions are evaluated for their significance to the economy. Specifically (NMFS 2007):

> If a proposed action is determined to be significant under E.O. 12866, the analysis undergoes further scrutiny by the Office of Management and Budget (OMB) to ensure that it meets the requirements of E.O. 12866. A 'significant regulatory action' means any regulatory action that is likely to result in a rule that may –
>
> - Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities;
>
> - Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
>
> - Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
>
> - Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

There are only four regulatory actions contemplated in this document:

1) Specifying a maximum harvest limit (quota) for Atlantic surfclams in federal waters for the years 2011, 2012, and 2013.

2) Specifying a maximum harvest limit (quota) for ocean quahogs in federal waters for the years 2011, 2012, and 2013 *outside* the Maine (mahogany) ocean quahog zone.

3) Specifying a maximum harvest limit (quota) for ocean quahogs in the Maine (mahogany) ocean quahog zone for the years 2011, 2012, and 2013.

4) Making a determination as to whether the minimum size limit of 4.75 inches for surfclams should continue to be suspended for 2011, 2012, and 2013.

Details on the potential impacts of these regulatory actions are presented in the following sections. However the very simple nature of these actions enable a summary evaluation of E.O. 12866 significance here at the outset.

● *Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities;*

The preferred alternatives proposed in this rule making would not have an adverse impact on the economy or the sector comprising the East Coast clam industry. In all cases the recommended alternatives preserve the status quo, resulting in no decrease in harvest levels or ex-vessel revenues relative to those currently experienced.

Furthermore, the East Coast clam industry is itself too small to generate significant impacts relative to the US economy as a whole. Based on federal logbook reports, the total ex-vessel value of the EEZ surfclam fishery was approximately $30.0 million in 2009; the ocean quahog EEZ ITQ fishery was $23.0 million; and the Maine ocean quahog fishery in federal waters was $2.0 million. Combined they generated a total gross ex-vessel value of $55.0 million in 2009. It is difficult to conceive of any regulation that the federal government might issue which would have secondary or cumulative impacts that would exceed a $100 million impact threshold.

Note that the establishment of annual quotas in these fisheries is necessary to maintain the harvest of surfclams and ocean quahogs at sustainable levels. The proposed actions will not adversely affect, in the long-term, competition, jobs, the environment, public health or safety, or state, local, or tribal government communities.

- *Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;*

The Mid-Atlantic Council and NMFS have the sole authority to regulate fishing quotas in federal waters, thus these quota specifications do not overlap or otherwise interfere with those generated by any other agency.

- *Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof;*

The proposed actions have no bearing on entitlements, grants, user fees, or loan programs or the rights and obligations of their participants.

- *Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.*

The proposed actions support and maintain the fisheries management program implemented by the Atlantic Surfclam and Ocean Quahog Fishery Management Plan and subsequent Amendments. The ITQ system instituted in the fall of 1990 has been largely credited with successfully addressing the problems of overcapitalization and inefficiency inherent in many effort-based management systems. It has provided a high level of stability, efficiency, and improved profitability to the utilization of these resources. As such, the proposed actions do not raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The benefits of a stable, ITQ management program are additionally evident from the absence of constant legal challenge, which many of the alternative management programs in the country have become subject to.

2.1 Significance Conclusion

Due to the lack of meeting any of the four criteria described above, it is determined that the proposed 2011, 2012, and 2013 quotas for the surfclam and ocean quahog fisheries do not constitute a "significant" regulatory action.

3.0 DESCRIPTION OF MANAGEMENT OBJECTIVES

A description of the management objectives of the Atlantic Surfclam and Ocean Quahog FMP are presented in the Environmental Assessment (EA) section 4.2 "Management Objectives and Management Unit of the FMP" of this document.

4.0 DESCRIPTION OF THE FISHERY

A description of the all the fisheries impacted by the proposed rules is presented in EA section 6.4 "Description of the Fishery and Socioeconomic Environment." A short discussion of ports and communities, the federal fleet, and the processing sector is provided in EA sections 6.4.1 through 6.4.3. The state and federal fisheries for surfclams are described in EA section 6.4.4. The ITQ fishery for ocean quahogs is presented in EA section 6.4.5. Finally, the small-scale Maine ocean quahog fishery is described in EA section 6.4.6.

Federal Surfclam and Ocean Quahog Quotas and Landings: 1979 - 2010.

Surfclams (Thou Bushels)					Ocean Quahogs (Thou. Bushels)			
* Georges Bank first closed for PSP in 1990					* Maine ocean quahog fishery excluded 1991 - 2009			
Year	**Landings**	**Quota**	**% Harvested**		**Year**	**Landings**	**Quota**	**% Harvested**
1979	1,674	1,800	93%		1979	3,035	3,000	101%
1980	1,924	1,825	105%		1980	2,962	3,500	85%
1981	1,976	1,825	108%		1981	2,888	4,000	72%
1982	2,003	2,400	83%		1982	3,241	4,000	81%
1983	2,412	2,450	98%		1983	3,216	4,000	80%
1984	2,967	2,750	108%		1984	3,963	4,000	99%
1985	2,909	3,150	92%		1985	4,570	4,900	93%
1986	3,181	3,225	99%		1986	4,167	6,000	69%
1987	2,820	3,120	90%		1987	4,743	6,000	79%
1988	3,032	3,385	90%		1988	4,469	6,000	74%
1989	2,838	3,266	87%		1989	4,930	5,200	95%
1990*	3,114	2,850	109%		1990	4,622	5,300	87%
1991	2,673	2,850	94%		1991*	4,840	5,300	91%
1992	2,812	2,850	99%		1992*	4,939	5,300	93%
1993	2,835	2,850	99%		1993*	4,812	5,400	89%
1994	2,847	2,850	100%		1994*	4,611	5,400	85%
1995	2,545	2,565	99%		1995*	4,628	4,900	94%
1996	2,569	2,565	100%		1996*	4,391	4,450	99%
1997	2,414	2,565	94%		1997*	4,279	4,317	99%
1998	2,365	2,565	92%		1998*	3,897	4,000	97%
1999	2,538	2,565	99%		1999*	3,770	4,500	84%
2000	2,561	2,565	100%		2000*	3,161	4,500	70%
2001	2,855	2,850	100%		2001*	3,691	4,500	82%
2002	3,113	3,135	99%		2002*	3,871	4,500	86%
2003	3,244	3,250	100%		2003*	4,069	4,500	90%
2004	3,138	3,400	92%		2004*	3,823	5,000	77%
2005	2,744	3,400	81%		2005*	2,940	5,333	55%
2006	3,057	3,400	90%		2006*	3,066	5,333	57%
2007	3,231	3,400	95%		2007*	3,366	5,333	63%
2008	2,920	3,400	86%		2008*	3,426	5,333	64%
2009	2,594	3,400	76%		2009*	3,434	5,333	64%
2010	n/a	3,400	---		2010*	n/a	5,333	---

Source: NMFS Clam Vessel Logbook Reports, Woods Hole, MA

5.0 PROBLEM STATEMENT

The need for federal regulation of fisheries has at its core the tendency for common property resources to become degraded through overuse, and the potential benefits to society dissipated. These issues were addressed in the surfclam and ocean quahog fisheries off the Atlantic coast through implementation of an ITQ management program in September of 1990. Industry participants benefit from a high degree of flexibility in their fishing operations, as government regulation is basically reduced to quota holders not exceeding their individual allowances. Industry members are free to trade quota amongst themselves as best suits their individual business needs. Costs to society are minimized and efficiency greatly enhanced when the use of effort limitation and closed seasons to limit total annual harvests can be avoided. These tools have the unfortunate side effect of overcapitalizing fisheries with unneeded vessels that are obliged to operate inefficiently, dramatically reducing the net benefits that a society might have received from its fishery resources.

The surfclam and ocean quahog fisheries are two out of a handful of fisheries around the United States that have been able to successfully implement ITQ management programs, providing substantial benefits to fishery participants and the nation at large. A continuing task remains, however, in monitoring the status of these living resources and determining the maximum quantity that can be safely removed from them each year, without damaging their health or the health of the ecosystem in which they reside.

The information available to fishery managers and the public in making these annual quota decisions is incomplete and subject to uncertainty. Key biological information on life history and the actual numbers of these animals hidden beneath the waves must be estimated rather than known with certainty. Important information on the human side of the equation is also missing, including comprehensive data on the costs of harvest and processing, as well as estimates of the industry supply and demand functions at the wholesale, and retail product levels.

Regardless, an extensive economic analysis was conducted using the available data as part of Amendment 13 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan (MAFMC 2003). Quantitative results of the analysis relative to different quota alternatives are presented in this document where applicable. Qualitative results and professional judgement are presented when quantitative information is unavailable.

Further information on the purpose and need for the annual quota specification process can be found in EA section 4.1.

6.0 DESCRIPTION OF MANAGEMENT ALTERNATIVES

A detailed description of all management alternatives considered in the proposed rule is presented in EA section 5.0. The following sections provide a brief overview.

6.1 Quotas for the ITQ Fisheries

Alternatives for 2011, 2012, and 2013 ITQ Fisheries.				
Surfclams				
	Description	2011 Quota (bu)	2012 Quota (bu)	2013 Quota (bu)
Alt. S1	Min. Allowable	1.850 million	1.850 million	1.850 million
Alt. S2	Slight Decrease	3.250 million	3.250 million	3.250 million
Alt. S3**	Status Quo	3.400 million	3.400 million	3.400 million
Alt. S4	No Action (Quota Removed)	Unlimited	Unlimited	Unlimited
Ocean Quahogs				
	Description	2011 Quota (bu)	2012 Quota (bu)	2013 Quota (bu)
Alt. Q1	Min. Allowable	4.000 million	4.000 million	4.000 million
Alt. Q2	Slight Decrease	5.000 million	5.000 million	5.000 million
Alt. Q3**	Status Quo	5.333 million	5.333 million	5.333 million
Alt. Q4	Max. Allowable	6.000 million	6.000 million	6.000 million
Alt. Q5	No Action (Quota removed)	Unlimited	Unlimited	Unlimited
** Recommendation				

Four quota alternatives are discussed for the federal surfclam ITQ fishery, and five alternatives are discussed for the ocean quahog ITQ fishery apart from Maine.

The Council's choice was bounded by minimum and maximum quota levels that are specified as the OY range in the Atlantic Surfclam and Ocean Quahog Fishery Management Plan, and may not be exceeded in either direction without an amendment to the Plan. The current OY range for each fishery is as follows:

Surfclams	1.850 million to 3.400 million bushels
Ocean Quahogs	4.000 million to 6.000 million bushels

In addition to quota alternatives falling within the OY range, a brief discussion of the 'no action' alternative will also be included. Consideration of the 'no action' alternative is important because it shows what would happen if the proposed action is not taken. In the case of these ITQ fisheries, the failure to specify annual quotas and issue cage tags would have the draconian impact of nullifying the ITQ system itself and allowing unlimited harvests. Given that this is not currently a legal alternative for the Council to recommend, its treatment will be brief.

For the surfclam fishery, the quota alternatives numbered 1 and 3 correspond to the minimum and maximum allowable quotas specified in the current OY range of the FMP. For the ocean quahog ITQ fishery, these alternatives are numbered 1 and 4.

Alternatives which would maintain the status quo quotas are always included for consideration in each fishery, and correspond to Alternative S3 for surfclams (3.400 million bushels) and Alternative Q3 for ocean quahogs (5.333 million bushels). As it happens, the 2010 quota for surfclams is already set to the maximum allowable level of 3.400 million bushels, so Alternative S3 equates to both the status quo alternative and the maximum allowable alternative.

In the past, the identification of additional quota alternatives beyond the minimum, maximum and status quo levels often took the form of modest increases or decreases from the status quo in the direction deemed most appropriate at the time. However, regulations implementing Amendment 13 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan published Dec. 16, 2003 required for the first time that quotas for each fishery be specified for a three-year interval. The first set of three-year quotas was specified in 2004 and applied to the fishing years of 2005, 2006, and 2007. The second set of three-year quotas was specified in 2007 and applied for the fishing years 2008, 2009, and 2010. The Council is now recommending quotas for the third three-year cycle of years 2011, 2012, and 2013 (Section 1.0 of the EA).

Since resource conditions may potentially change for the worse or the better as time unfolds, flexibility was built into the new regulatory process such that the quotas specified for the second and third year of each three-year interval can be modified as necessary as they approach. Hence the public is strongly advised to consider the 2012 and 2013 quotas recommended in this process as 'provisional,' and subject to change either up or down as conditions warrant, within the allowable OY range.

The recommended alternative for the ocean quahog ITQ fishery is Alternative Q3. It was proposed to the Council by industry, and would maintain the status quo quota of 5.333 million bushels for the next three years. The actual ocean quahog harvests in recent years have been far below their allowable levels. From 1999 through 2003 the ocean quahog quota was set at 4.500 million bushels. During that interval landings ranged from 30% below the quota (~3.2 million bu. in 2000) to 9% below the quota (~4.1 million bu. in 2003). From the vantage point of 2004, it appeared that the quota might become constraining on the industry. Given assessments indicating that the ocean quahog quota could safely be raised, the industry requested and the Council agreed to increasing the quota by 0.333 million bushels in each of 2005, 2006, and 2007.

Unfortunately, the industry miscalculated and was unable to make use of any of the quota increases beyond 4.500 million bushels, resulting in large ocean quahog quota surpluses in both 2005 and 2006. Industry then asked the Council to cancel the scheduled increases beyond 5.333 million bushels, and has since asked that the quota be maintained at that level. Recent concerns have been raised regarding the potential impacts of large quota surpluses, which result when some allocation owners are unable to find market for their allocation.

The quota decision to be made in the surfclam fishery is surrounded by quite different circumstances. While the most recent stock assessment (USDC 2009b) found that the surfclam resource is not overfished, the health of the fishery that depends upon it is in question. Catch rates have been declining steadily in the traditionally-fished areas off the mid-Atlantic coast, and the largest untapped portion of the resource on GBK is still unavailable due to the presence of

PSP. The greatest "wild card" in the recommendations is the status of the GBK resource. Closed since 1990 due to the presence of PSP, the resource there should effectively be in a near virgin state. The proposed rule to open the Cultivator Shoal portion of GBK that was published in the *Federal Register* (75 FR 37745; June 30, 2010) is currently open for comment and if and when Cultivator Shoal opens to fishing, a significant amount of concern will be reduced (see discussion in the Executive Summary).

An analysis of the expected impacts of each alternative will be presented in RIR section 7.0. After deliberation and the opportunity for public comment, the Council voted at its June 2010 meeting to recommend Alternatives S3 and Q3 to the Secretary of Commerce. Alternative S3 would maintain the federal surfclam quota at the current maximum level of 3.400 million bushels for 2011, 2012, and 2013. Alternative Q3 would maintain the federal ocean quahog quota at the current level of 5.333 million bushels for the next three years as well. The vote in June 2010 by the Council was nearly unanimous with only one member opposed and the RA abstaining.

6.2 Quotas for the Maine Ocean Quahog Fishery

Alternatives for 2011, 2012, and 2013 Maine Ocean Quahog Fishery.				
	Description	2011 Quota	2012 Quota	2013 Quota
Alt. M1	50% of Max. Quota	50,000 Maine Bu.	50,000 Maine Bu.	50,000 Maine Bu.
Alt. M2	Slight Decrease	90,000 Maine Bu.	90,000 Maine Bu.	90,000 Maine Bu.
Alt. M3**	Max Allowable - Status Quo	100,000 Maine Bu.	100,000 Maine Bu.	100,000 Maine Bu.
Alt. M4	No Action (Quota removed)	Unlimited	Unlimited	Unlimited
** Recommendation				

The Maine ocean quahog fishery is distinct in several key respects. First, it is a small-scale fishery that produces high-value product for the fresh, half-shell market. Amendment 10 (MAFMC 1998) to the FMP defined a Maine ocean quahog management zone with a maximum annual quota of 100,000 Maine bushels, which could not be increased until a formal, peer-reviewed assessment of the zone was completed. Maine produced a peer-reviewed stock assessment in 2007 and 2009 (USDC 2009a). The Maine quota is open to all vessels holding Maine ocean quahog permits, and is not subdivided into individual allocation shares. Finally, the Maine fishing grounds are actively monitored for PSP toxin, and have experienced closures in recent years.

Four alternative quotas were identified for the Maine ocean quahog fishery. Alternative M1 corresponds to a 50% reduction from the maximum allowable quota under the current management plan. Alternative M2 corresponds to a slight decrease of 10% to 90,000 Maine bushels. It was proposed to provide the Council with an option for a modest change in the direction of the quota. Alternative M3 would maintain the Maine quota at the current maximum allowable amount of 100,000 Maine bushels for the next three years. Finally, M4 is the 'no

action' alternative representing what would occur if the quotas were removed and harvests unlimited.

The Council is recommending that the Maine ocean quahog quota remain unchanged at the initial maximum quota level of 100,000 Maine bushels (1 bushel = 1.2445 cubic feet) for 2011, 2012, and 2013 (Alternative M3). As with the ITQ fisheries for surfclams and ocean quahogs, it is important for the public to understand that the Year 2 and Year 3 quotas for Maine ocean quahogs are subject to change in the future if circumstances warrant.

According to 50 CFR Section 648.76 (2)(b)(iv): *The Regional Administrator will monitor the quota based on dealer reports and other available information and shall determine the date when the quota will be harvested. NMFS shall publish notification in the Federal Register advising the public that, effective upon a specific date, the Maine mahogany quahog quota has been harvested and notifying vessel and dealer permit holders that no Maine mahogany quahog quota is available for the remainder of the year.*

It must also be remembered that according to 50 CFR Section 648.76 (2)(b)(iii): *All mahogany quahogs landed by vessels fishing in the Maine mahogany quahog zone for an individual allocation of quahogs under Section 648,70 will be counted against the ocean quahog allocation for which the vessel is fishing.* In other words, even after the initial maximum quota of 100,000 Maine bushels is harvested from the Maine mahogany ocean quahog zone (north of $43^{o}50^{'}$), vessels could obtain/use ITQ allocation and continue to fish in this zone. It is possible that some Maine fishermen will again rent ITQ allocation if the 100,000 bushel quota is reached in the future, as they have in the past.

6.3 Surfclam Size Limit Suspension

The Council recommends that the surfclam minimum size limit remain suspended in 2011, 2012, and 2013. The minimum length for surfclams is 4.75 inches. According to 50 CFR Section 648.72 ©: *Upon the recommendation of the MAFMC, the Regional Administrator may suspend annually, by publication in the Federal Register, the minimum shell-height standard, unless discard, catch, and survey data indicate that 30% of the surfclams are smaller than 4.75 inches (12.065 cm) and the overall reduced shell height is not attributable to beds where the growth of individual surfclams has been reduced because of density dependent factors.*

7.0 ANALYSIS OF ALTERNATIVES

The objective of this analysis is to describe clearly and concisely the economic effects of the various alternatives. The types of effects that should be considered include the following:

- Changes in net benefits within a benefit-cost framework.
- Changes in benefits and costs of groups of individuals, businesses of differing sizes, and other entities (including small communities and governmental entities).
- Changes in income and employment.
- Cumulative impacts of regulations.
- Changes in other social concerns.

A more detailed description of the economic concepts involved can be found in *"Guidelines for Economic Reviews of National Marine Fisheries Service Regulatory Actions"* (NMFS 2007), as only a brief summary of key concepts will be presented here.

Benefit-cost analysis is conducted to evaluate the net social benefit arising from changes in consumer and producer surpluses that are expected to occur upon implementation of a regulatory action. Total Consumer Surplus (CS) is the difference between the amounts consumers are willing to pay for products or services and the amounts they actually pay. Thus CS represents net benefits to consumers. When the information necessary to plot the supply and demand curves for a particular commodity is available, consumer surplus is represented by the area that is below the demand curve and above the market clearing price where the two curves intersect. A substantial empirical analysis was conducted as part of Amendment 13 to the Atlantic Surfclam and Ocean Quahog FMP (MAFMC 2003), which estimated changes in benefits and costs at two alternative levels of the surfclam quota. Where applicable, the results of that analysis will be included here. For those alternatives for which quantitative estimates are not available, a qualitative approach to the economic assessment was adopted.

An evaluation of consumer surplus for either species is further complicated by the fact that there are few retail markets for unprocessed surfclams or ocean quahogs outside of Maine. All of the landings from the ITQ fisheries are sold to processors who then add value by processing them into a variety of product forms. Boxes of frozen, breaded surfclam strips, cans of "clamato" juice, or chopped "clam meats" are the more common items that may be found on retail grocer's shelves. The majority of production is sold at the wholesale level to restaurants or other processors in the food industry that use them as ingredients in chowders and sauces.

Net benefit to producers is producer surplus (PS). Total PS is the difference between the amounts producers actually receive for providing goods and services and the economic cost producers bear to do so. Graphically, it is the area above the supply curve and below the market clearing price where supply and demand intersect. Economic costs are measured by the opportunity cost of all resources including the raw materials, physical and human capital used in the process of supplying these goods and services to consumers.

One of the more visible costs to society of fisheries regulation is that of enforcement. From a budgetary perspective, the cost of enforcement is equivalent to the total public expenditure devoted to enforcement. However, the economic cost of enforcement is measured by the opportunity cost of devoting resources to enforcement vis à vis some other public or private use and/or by the opportunity cost of diverting enforcement resources from one fishery to another.

7.1 Analysis of Surfclam Alternatives

Surfclam Quota Alternatives for 2011, 2012, and 2013.				
	Description	2011 Quota (bu)	2012 Quota (bu)	2013 Quota (bu)
Alt. S1	Min. Allowable	1.850 million	1.850 million	1.850 million
Alt. S2	Slight Decrease	3.250 million	3.250 million	3.250 million
Alt. S3**	Status Quo	3.400 million	3.400 million	3.400 million
Alt. S4	No Action (Quota	Unlimited	Unlimited	Unlimited

	Removed)			
** Recommendation				

7.1.1 Areas of Impact that Do Not Change Regardless of the Alternative

7.1.1.1 Harvest costs (all alternatives)

In specifying an annual quota for the federal surfclam fishery, the government is placing a cap on total removals from the resource located in federal waters. No companion regulations that would impact the type, quantity, or method of gear utilization in the fishery are in effect at this time. Adoption of ITQ management in the surfclam and ocean quahog fisheries has negated the need for most gear and effort regulations, which have the greatest impact on the efficiency and costs of harvest operations.

Allowing the industry to trade allocation among its members enables businesses to adjust capital, labor, and output to the levels that maximize profitability, and minimize costs.

The two remaining management tools in the FMP that have the potential to increase harvest costs directly are closed areas and the minimum size limit for surfclams. Closing nursery areas or creating "sanctuaries" to protect living resources and habitat in a specific area will typically oblige fishermen to limit their operations to areas which may be less productive or more distant, thereby driving up costs.

Use of the surfclam minimum size restriction in the past has motivated vessels to install "sorters" which cull out smaller individuals and then route them back overboard. In addition to slowing the harvest process, sorters will add to the damage inflicted by dredging, resulting in substantial mortality to those small clams that are returned to the ocean.

Fortunately, recent assessment work has suggested that the overall health of the surfclam resource is better than it was thought to be in the mid-to late 1990's. This allowed the Council to recommend increasing the quota to its maximum level in 2004.

For these reasons, it is considered that none of the surfclam quota alternatives presented in this document will have the effect of significantly altering harvest costs.

7.1.1.2 Enforcement costs (all alternatives)

Adoption of ITQ management in the surfclam and ocean quahog fisheries has allowed enforcement officials to focus attention on a limited number of shoreside processing plants, as opposed to large expanses of the ocean to monitor effort restrictions. Instead of ensuring that vessels were operating only on their allowed fishing days, which required the use of expensive Coast Guard cutters and aircraft, enforcement officials can restrict their efforts to the accounting task of ensuring that all clam shipping containers bear an official government "tag." Once a tag is attached to a "cage" full of surfclams or ocean quahogs, it cannot be removed without destroying it. This prevents tags from being reused, and the annual quota from being exceeded.

Compliance with the regulations under the ITQ system is widely thought to be high. Perhaps the most significant reason for this is that the harvest rights represented by an allocation are valuable, and could be forfeited if repeated violations were uncovered. This fact alone creates a situation where violators have much more to lose than gain by failing to place tags on a shipment of surfclams.

A second factor relates to the question of who is thought to be harmed by a violation. In a fishery managed as an open access, violators may well feel they are only cheating "the government." In an ITQ managed fishery, the fishermen themselves are more highly vested in a fishery, and are more likely to view cheaters as stealing from themselves, rather than the government. Hence they are more likely to report violations they witness.

None of the management alternatives under consideration for surfclams would alter this enforcement dynamic, and therefore are not identified as leading to a change in enforcement costs.

7.1.1.3 Distributive impacts (all alternatives)

There are no changes to the quota allocation process for this species. As such, no distributional effects are identified under any of the evaluated alternatives. Potential distributive impacts that may have occurred under implementation of the ITQ system are already largely in place; as such, no new distribute impacts among allocation owners are expected from the evaluated quota allocations. However, recent concerns have been focused on the potential impacts of large quota surpluses, which result when some allocation owners are unable to find a market for their allocation over a period of years. These potential impacts of quota surpluses are discussed in section 7.1.6 of the RIR/IRFA.

7.1.2 Preferred Alternative S3 - Maximum Allowable / Status Quo Surfclam Quota - 3.400 Million Bu.

Maintaining the surfclam quota at the current maximum allowable level of 3.400 million bushels for 2011, 2012, and 2013 was the industry and Committee recommendation to the Mid-Atlantic Council. After receiving comments from the public, the Council considered the issue and voted to accept the recommendation.

7.1.2.1 Landings

Maintaining the surfclam quota at 3.400 million bushels in 2011, 2012, and 2013 would preserve the status quo and represent no change in landings.

7.1.2.2 Ex-vessel prices

Demand for clam products declined sharply in 2005 due to a glut of clam meats on the market. Industry sources have reported that new imports of clam meat from Asia and Canada contributed to the glut, as well as major food companies scaling back their purchases for use in soups and chowders. In 2006 the oversupply started to ease and purchases began to slowly inch back up. An economic analysis conducted in Amendment 13 estimated the changes in ex-vessel prices, revenue, consumer surplus, operating costs, producer surplus, and net benefits from changes in the annual quota (MAFMC 2003 Table 58). Potential quotas evaluated in the analysis included 3.135 million bushels and 3.400 million bushels. Since that time the Council has considered a number of additional quota levels during the annual quota specification process, therefore extrapolated values were generated for 1.850, 3.250, and 3.325 million bushels and are included in the table below.

Economic Impacts of Proposed Essential Fish Habitat Regulations and New Surfclam Quotas. Excerpt and extrapolation from MAFMC 2002 Table 58.							
Surfclams							
Quota/Landings	Trips	Price	Revenue	Consumer Surplus	Operating Costs	Producer Surplus	Net Benefits
*1.850 mill. bu.	1,571	9.78	18,877,507	1,693,848	6,747,678	12,129,829	13,823,677
3.135 mill. bu.	2,662	9.30	29,154,224	1,826,470	10,583,927	18,570,297	20,396,767
*3.250 mill. bu.	2,760	9.26	30,073,930	1,838,339	10,927,249	19,146,681	20,985,020
*3.325 mill. bu.	2,823	9.23	30,673,739	1,846,079	11,151,154	19,522,584	21,368,664
3.400 mill. bu.	2,887	9.20	31,273,547	1,853,820	11,375,060	19,898,487	21,752,307
* Extrapolated values							

The values in this table have not been adjusted for inflation in the intervening years, and as such should only be considered as a guide for the relative magnitude of changes from one quota level to another. Additionally, the prices utilized in the analysis reflect values reported in vessel logbooks as opposed to dealer reports. Dealer reported prices first became available in NMFS databases starting in 2002, and are considered more likely to reflect the full value of the harvest than vessel reports. Vessel captains utilizing ITQ tags owned by the purchasing dealer are more likely to report trips as selling in the $5.00 - $8.00 range, omitting the approximately $5.00 value of the tag that was not a direct part of the transaction.

The average ex-vessel price of a bushel of surfclams as reported by dealers was $11.97 in 2009, an increase of $0.06 (less than 1%) from the 2008 average of $11.91 per bushel.

This alternative would maintain the federal surfclam quota unchanged at the current maximum level of 3.400 million bushels. Hence it would not be expected to have a direct impact on the ex-vessel price of surfclams.

It is likely, however, that ex-vessel surfclam prices could potentially rise in the near term due to other market forces. The costs of harvest operations in particular have been increasing due to three major factors: 1) increasing fuel and insurance costs; 2) a decline in the productivity of effort, as the premium New Jersey beds have been fished down; and 3) vessels have been steaming farther offshore to make their catches.

7.1.2.3 Consumer prices, consumer surplus, producer surplus, distributive impacts, and cumulative impacts over time

Given that this alternative would not change the federal surfclam quota, it should have no impact on consumer prices, consumer surplus, producer surplus, or cumulative impacts over time.

7.1.2.4 Risk of biological overexploitation

The surfclam resource as a whole is not overexploited. The traditional fisheries off the coast of New Jersey and the Delmarva peninsula are a concern due to falling catch rates in heavily fished

areas and the lack of new recruitment in these areas. Increased temperature is thought to be a significant contributing factor behind these events. Maintaining the current maximum quota of 3.400 million bushels should not pose a significant risk of biological overexploitation to the coastwide surfclam resource. However, it may facilitate a more rapid depletion of the surfclam resource off New Jersey than would occur if the quota were lowered.

As stated previously, the second and third year quotas in this three-year specification are subject to change, and can be lowered if additional information suggests such an action is necessary.

7.1.3 Alternative S1 - Minimum Allowable Surfclam Quota - 1.850 Million Bu.

7.1.3.1 Landings

The surfclam fleet has been capable to land 95 to 100% of the quota five years during the 2000-2009 period. On average, the fleet landed over 91% of the quota for the 2000-2009 period (landings data in RIR section 4.0). This indicates that if conditions are favorable (e.g., market forces, weather conditions), the fleet may be able to land the entire quota allocation. For the purpose of the analysis of this and the quota alternatives that follow, it will be assumed that the industry would be able to fully harvest 3.400 million bushels of clams in 2011, 2012, and 2013. Changing the surfclam quota to the minimum allowable under the existing management plan represents a 45.6% reduction in landings relative to the status quo.

7.1.3.2 Ex-vessel prices

A 45.6% decrease in quota from federal waters would have a significant impact on the market, and would most certainly lead to an increase in ex-vessel prices.

7.1.3.3 Consumer prices

It is likely that some of the increase in ex-vessel price will be passed along to consumers. Those products that contain a high proportion of surfclam meat, such as the fried clam "super-strips," would probably increase the most. Chowders and soups would likely be less affected.

7.1.3.4 Consumer surplus

The consumer price increases that would result from adoption of this alternative would lead to a decrease in consumer surplus. An extrapolation of the analysis conducted in Amendment 13 indicates that consumer surplus would decrease on the order of $160,000 following a quota reduction from 3.400 to 1.850 million bushels (MAFMC 2003 Table 58).

7.1.3.5 Producer surplus

The benefits to the harvesting sector of higher ex-vessel prices would be offset by the 45.6% decrease in federal surfclam harvests that could be sold. Whether a net increase or decrease in producer surplus would result depends on the magnitude of the ex-vessel price increase. In this analysis, it is assumed that the price increase would not compensate for the lost harvest opportunity, and result in a substantial reduction in producer surplus. The analysis conducted in Amendment 13 suggests that the reduction would be in the neighborhood of $7.8 million (MAFMC 2003 Table 58).

7.1.3.6 Cumulative impacts over time

If the federal surfclam harvest were to be reduced by 45.6% and remain at that level for a number of years, it would represent an enormous revenue loss for the industry as a whole. Likely impacts include the failure of businesses that have tighter profit margins. Efforts to finalize the PSP testing protocol for GBK would likely accelerate, in order to permit vessels to harvest surfclams and ocean quahogs from this area that is currently closed. Efforts to continue the development of the PSP testing protocol for GBK would likely accelerate, in order to permit vessels to harvest surfclams and ocean quahogs from this area that is currently closed. In addition, likely impacts include increased harvests of alternative sources of meat, such as ocean quahogs.

7.1.3.7 Risk of biological overexploitation

As described in prior sections, the surfclam resource as a whole is not overexploited. The risk of biological overexploitation after a 45.6% reduction in the federal quota should be extremely low.

7.1.4 Alternative S2 - Slight Decrease in Surfclam Quota - 3.250 Million Bu.

7.1.4.1 Landings

This alternative would return to the quota level that was in effect in 2003, and corresponds to a 4.4% reduction in landings relative to the status quo.

7.1.4.2 Ex-vessel prices

A 4.4% decrease in landings from federal waters would have a minor impact on the market, leading to an small increase in ex-vessel price relative to the status quo.

7.1.4.3 Consumer prices

It is likely that a portion of the increase in ex-vessel prices will be passed along to consumers.

7.1.4.4 Consumer surplus

The consumer price increases that would result from adoption of this alternative would lead to a decrease in consumer surplus. The analysis conducted in Amendment 13 suggests that the reduction would be in the neighborhood of $15,000 (MAFMC 2003 Table 58).

7.1.4.5 Producer surplus

The benefits to the harvesting sector of higher ex-vessel prices would be offset by the 4.4% decrease in federal surfclam harvests that could be sold. In this analysis, it is assumed that the price increase would not fully compensate for the lost harvest opportunity, and result in a reduction in producer surplus. The analysis conducted in Amendment 13 indicates that the reduction would be in the neighborhood of $750,000 (MAFMC 2003 Table 58).

7.1.4.6 Cumulative impacts over time

If the federal surfclam harvest were to be reduced by 4.4% and remain at that level for a number of years, it would likely represent a moderate revenue loss for the industry. Likely impacts include increased harvests of alternative sources of meat, such as ocean quahogs.

7.1.4.7 Risk of biological overexploitation

A 4.4% reduction in landings would likely ease pressure slightly on the heavily exploited areas off the coast of New Jersey. Landings per Unit of Effort (LPUE) for the federal surfclam fleet as a whole declined 9% in 2009, following a 12% decline in 2008. Adoption of this alternative would represent a modest decrease in the risk of biological overexploitation relative to the status quo.

7.1.5 No Action Alternative S4 - Surfclam Quota Removed

A 'no action' alternative is evaluated in the EA portion of this document because the National Environmental Policy Act requires that an EA consider all reasonable alternatives, including the preferred action and the 'no action' alternative.

The Mid-Atlantic Council is required by 50 CFR part 648 to recommend annual quotas that fall within the optimum yield range for each species. Failure to make a recommendation within these bounds is not a legal option, and would be inconsistent with National Standard 1 of the Magnuson-Stevens Act. Hence the 'no action' alternative will not be considered further in this section.

7.1.6 Potential Impacts of Quota Surpluses

As previously indicated, the surfclam fleet has been capable of landing 95 to 100% of the quota five times during the 2000-2009 period. On average, the fleet landed over 91% of the quota for the 2000-2009 period. While it appears that the fleet may be able to land the entire quota if conditions are favorable (e.g., market forces, weather conditions), there have been quota surpluses in the past. For example, the largest quota surplus for the last 10 years occurred in 2009 when a quota surplus of 0.806 thousand bushels occurred.

If the surfclam quota were to be cut 45.6% (1.850 million bushels; Alternative S1), there would be no surplus quota whatsoever, and all could be marketed. A smaller surplus quota would be expected under Alternative S2 (3.250 million bushels) when compared to Alternative S3 (3.400 million bushels).

7.1.7 Summary of Surfclam Impacts

Summary of Impacts for Proposed 2011, 2012, and 2013 Surfclam Quota Alternatives Relative to Status Quo Alternative S3: 3.400 Million Bushels.		
Feature	Alt. S1 Min. Allowable 1.850 million bushels	Alt. S2 Slight Decrease 3.250 million bushels
Landings	- 45.6%	-4.4%
Ex-vessel Prices	Significant +	Slight +
Consumer Prices	Significant +	Slight +
Consumer Surplus	Significant -	Slight -
Harvest Costs	0	0
Producer Surplus	Significant -	Slight -
Enforcement Costs	0	0
Distributive Impacts	0	0
Cumulative Impacts	+	Slight +
Risk of Biological Overexploitation	-	Slight -
+ indicates an increase relative to the status quo; - indicates a decrease relative to the status quo; 0 indicates no change; ? indicates unknown		

7.1.7.1 Summary justification for surfclam 3.400 million bushel quota recommendation

The Council identified four alternative quotas for the years 2011, 2012, and 2013. Since the 2009 quota of 3.400 million bushels is the maximum OY and the maximum allowable under the FMP, the two alternatives which would decrease the quota correspond to the minimum allowed under the FMP and the 2003 quota of 3.250 million bushels. The Council voted to recommend maintaining the maximum OY quota of 3.400 millions bushels primarily because the latest assessment found that the surfclam resource is not overfished and overfishing is not occurring.

A new survey is scheduled for the summer of 2011, and the next assessment will be closely watched for signs that a change in the course of management is warranted in the coming years.

7.2 Analysis of Ocean Quahog Alternatives

There are five alternative quota levels considered for the 2011, 2012, and 2013 ocean quahog ITQ fishery:

Alternative Ocean Quahog ITQ Fishery Quotas for 2011, 2012, and 2013.				
	Description	2011 Quota (bu)	2012 Quota (bu)	2013 Quota (bu)
Alt. Q1	Min. Allowable	4.000 million	4.000 million	4.000 million
Alt. Q2	Slight Decrease	5.000 million	5.000 million	5.000 million
Alt. Q3**	Status Quo	5.333 million	5.333 million	5.333 million
Alt. Q4	Max. Allowable	6.000 million	6.000 million	6.000 million
Alt. Q5	No Action (Quota removed)	Unlimited	Unlimited	Unlimited
** Recommendation				

At the June 2010 Council meeting in New York City, NY, the Mid-Atlantic Council voted nearly unanimously to recommend that the ocean quahog ITQ quota outside Maine be left unchanged at 5.333 million bushels for each of the next three years.

7.2.1 Summary Evaluation of All Ocean Quahog Quota Alternatives (Q1, Q2, Q3, and Q4) - Assumes NONE of the Quota Alternatives Would be Binding on the Industry

[*Note that the 'No Action Alternative Q5 - Ocean Quahog Quota Removed' is not a legal option for the Council to recommend, because 50 CFR part 648 requires that the annual quotas fall within the optimum yield range for each species. Hence the 'no action' alternative will not be considered further in this section.*]

Historically, the ocean quahog fishery outside of Maine has played a supplementary role to the surfclam fishery. The ocean quahog fishery was first initiated in 1976 by surfclam vessels in response to a major decline in the availability of surfclams. With a smaller meat and stronger flavor than surfclams, it commanded less than half the price in the marketplace. Ocean quahog beds were also located further offshore than surfclams, such that the added fuel costs were an additional damper on the profitability of ocean quahog trips.

The advantage that ocean quahogs have had are the massive, dense beds that have developed across decades or even centuries of time. Vessels have been able to harvest the long-lived animals in large quantities, very quickly. The resource off the Atlantic coast has supported intense harvests for over three decades, and the fleet has typically harvested an area until the catch rates decline to a certain point, and then moved to new grounds.

The annual quotas for ocean quahogs have generally been set substantially higher than the levels industry has chosen to harvest. From 1998 through 2002, harvests did not even reach the minimum quota level of 4.000 million bushels. Only in 2003 did harvests inch back above the minimum with total landings of 4.077 million bushels. Then when a large surplus of clam meats was on the market in 2005 and 2009, landings fell back to the 3.000 million bushel level. The potential impacts of quota surpluses are discussed in section 7.2.3 of the RIR/IRFA.

The optimum yield range currently specified in the Atlantic Surfclam and Ocean Quahog FMP is between 4.000 and 6.000 million bushels. Hence the quota alternatives which the Council may recommend to the Secretary of Commerce must all fall within that allowable range. **When**

industry harvests do not even reach the relevant quota range, none of the alternatives would be binding on the industry, and hence none of the alternatives are expected to have any impact on the following areas:

Landings
Ex-vessel prices
Consumer prices
Consumer surplus
Harvest costs
Producer surplus
Enforcement costs
Distributive impacts
Cumulative Impacts
Risk of biological overexploitation

7.2.2 Alternative Q5 - No Action (Quota Removed)

A 'no action' alternative is evaluated in the EA portion of this document because the National Environmental Policy Act requires that an EA consider all reasonable alternatives, including the preferred action and the 'no action' alternative.

The Mid-Atlantic Council is required by 50 CFR part 648 to recommend annual quotas that fall within the optimum yield range for each species. Failure to make a recommendation within these bounds is not a legal option, and would be inconsistent with National Standard 1 of the Magnuson-Stevens Act. Hence the 'no action' alternative will not be considered further in this section.

7.2.3 Potential Impacts of Quota Surpluses

There are no changes to the quota allocation process for this species. As such, no distributional effects are identified under any of the evaluated alterative. Potential distributive impacts that may have occurred under implementation of the ITQ system are already largely in place; as such, no new distribute impacts among allocation owners are expected from the evaluated quota allocations. However, recent concerns have been focused on the potential impacts of large quota surpluses, which result when some allocation owners are unable to find a market for their allocation over a period of years. Quota shares in the ITQ fisheries for surfclams and ocean quahogs are held by large corporations as well as small, independent fishermen. One concern that has been raised is that when large amounts of quota are not utilized by industry, the revenue losses from unsold quota may fall disproportionally on independent fishermen with lesser access to a market. If these losses fall repeatedly on the same individuals over a period of years, they may be forced to cease operations, or sell their quota allocations at a loss. The relative size of any such impacts would be expected to be proportional to the amount of surplus quota that could occur: greater impacts from larger surpluses, and lesser impacts from smaller surpluses.

An analysis was conducted in an attempt to evaluate the potential impacts of the large increase in surplus ocean quahog quota that resulted when the federal quota was increased twice in recent years. The federal ocean quahog quota had remained constant at 4.500 million bushels for the 5-year interval from 1999 through 2003. It was first increased in 2004 from 4.500 million bushels to 5.000 million bushels. Then in 2005 it was increased again from 5.000 million bushels to

5.333 million bushels. The market was unable to absorb either of the two increases in quota, and the 2005 increase occurred precisely at the point in time when the glut of clam meats on the market was at its peak. The quota has been set at 5.333 million bushels since 2005.

Given that the industry has only once in the past decade harvested ocean quahogs at a level reaching the minimum quota the Council may set of 4.000 million bushels, as a practical matter the only impact the federal quota has on the industry is to determine the relative size of the quota surplus. Indirectly, this will impact the distribution of who will be able to sell or rent their allocation, and at what price. If the surplus is zero, then 100% of the allocation owners will be able to sell 100% of their tags, and rental prices will remain higher. If the surplus is large, then rental prices will be driven down, and those owners willing to rent for a lower price that have better access to a market will benefit.

7.2.4 Summary of Ocean Quahog Impacts

A summary of all impacts that can be expected from a repetition of the historical ocean quahog landing pattern in 2011, 2012, and 2013, in which quotas are not binding on the industry, is represented in the following table.

Summary of Impacts for Alternative Ocean Quahog Quota Levels Relative to Status Quo of 5.333 Million Bushels - Assumes NONE of the Quota Alternatives are Binding on the Industry (Landings Below 4.000 Million Bushels).			
Feature	**4.000 million bushels** Alt. Q1 Min. Allowable	**5.000 million bushels** Alt. Q2 Slight Decrease	**6.000 million bushels** Used by: Alt. Q4 Max. Allowable
Landings	- 25.0% allowed (assumes less than 4 mill. harvested)	- 6.2% allowed (assumes less than 4 mill. harvested)	+ 12.5% allowed (assumes less than 4 mill. harvested)
Ex-vessel Prices	0	0	0
Consumer Prices	0	0	0
Consumer Surplus	0	0	0
Harvest Costs	0	0	0
Producer Surplus	0	0	0
Enforcement Costs	0	0	0
Distributive Impacts	0	0	0
Cumulative Impacts	0	0	0
Risk of Biological Overexploitation	0	0	0
+ indicates an increase relative to the status quo; - indicates a decrease relative to the status quo; 0 indicates no change; ? indicates unknown			

7.2.4.1 Summary justification for ocean quahog 5.333 million bushel quota recommendation

The Council identified five alternative quotas for the years 2011, 2012, and 2013. Alternatives Q1, Q2, and Q4 represent a 25.0% decrease, a 6.0% decrease, and a 12.5% increase, respectively, when compared to the quota implemented in 2009 (i.e., 5.33 million bushels; status quo quota Q3). The Council voted to recommend maintaining the 5.333 million bushels quota for 2011, 2012, and 2013 primarily because the latest assessment found that the ocean quahog resource is not overfished and overfishing is not occurring. Furthermore, this alternative would allow the industry to have more room for growth in the coming years.

A new survey is scheduled for the summer of 2011, and the next assessment will be closely watched for signs that a change in the course of management is warranted in the coming years.

7.3 Maine Ocean Quahog Fishery Quota

Alternatives for 2011, 2012, and 2012 Maine Ocean Quahog Fishery.				
	Description	2011 Quota	2012 Quota	2013 Quota
Alt. M1	50% of Max. Quota	50,000 Maine Bu.	50,000 Maine Bu.	50,000 Maine Bu.
Alt. M2	Slight Decrease	90,000 Maine Bu.	90,000 Maine Bu.	90,000 Maine Bu.
Alt. M3**	Max Allowable - Status Quo	100,000 Maine Bu.	100,000 Maine Bu.	100,000 Maine Bu.
Alt. M4	No Action (Quota removed)	Unlimited	Unlimited	Unlimited
** Recommendation				

7.3.1 Preferred Alternative M3 - Maximum Quota - 100,000 Bu. (Status Quo)

This alternative would maintain the status quo quota of 100,000 Maine bushels for 2011, 2012, and 2013, and represents the baseline against which all other quota alternatives will be measured. At its June 2010 Council meeting in New York City, NY, the Council voted nearly unanimously to recommend this alternative as its preferred for the Maine fishery. The Maine quota pertains to the zone of both state and federal waters off the eastern coast of Maine north of 43 degrees 50 minutes north latitude. Amendment 10 (MAFMC 1998) established management measures for this small artisanal fishery in May of 1998, and specified an initial maximum quota of 100,000 bushels. This same level has been maintained each year through 2010. Harvests in the Maine zone may exceed this level only if quota is rented from the ITQ portion of the ocean quahog fishery.

7.3.1.1 Maine landings records and resource assessment

Obtaining comprehensive landings data for the Maine fishery has been a challenge due to a number of factors. The State of Maine does not yet have a mandatory reporting requirement for vessels, only dealers and processors. In 1991 Maine ocean quahog vessels started submitting landings reports in federal shellfish logbooks as a condition of receiving permits to participate in the experimental fishery for ocean quahogs in the federal waters off Maine. Initially, some of the

vessels that participated in multiple fisheries mistakenly recorded ocean quahog trips in the federal Vessel Trip Report (VTR) logbooks intended for use on finfish trips.

Amendment 10 included a provision for a federal limited access Maine (mahogany) ocean quahog permit for those vessels that had participated in the experimental fishery and reported landings in federal logbooks prior to January 1, 1998. Some vessels that did not qualify for the federal permit but did have a valid state permit for ocean quahogs were allowed to continue fishing in Maine state waters. An agreement was reached between the Council and the Maine Department of Marine Resources (DMR) that all landings from either state or federal waters in the Maine zone would count against the 100,000 quota.

An effort was also made to standardize the reporting of vessel landings by requiring all vessels to report using the federal clam logbooks, even if they held only a state permit and were restricted to fishing in Maine state waters.

Discussions with Maine DMR personnel indicate that any current landings of ocean quahogs that are not captured on federal vessel logbooks should be quite small, and that all landings should be captured on dealer reports because there are no Maine quahog dealers that do not have a federal permit.

A summary of the latest information on the Maine ocean quahog fishery is included in section 6.4.6 of the first portion of this document.

Given the stability that has been apparent in the Maine fishery in recent years, the Mid-Atlantic Council does not feel there is justification for reducing the Maine quota below the current 100,000 bushel maximum for the coming three-year quota interval. The State of Maine has requested continuance of the 100,000 bushel quota.

7.3.2 Alternative M1 - 50% of Maximum Quota - 50,000 Bu.

7.3.2.1 Landings

The Maine ocean quahog fleet has been capable of landing 100% of the quota eight years during the 2000-2009 period. In fact, during those eight year, the fleet landed approximately 13% above the original 100,000 Maine bushels quota. Only in 2008 and 2009, the fleet landed 33% and 44% below the quota, respectively. This indicates that if conditions are favorable (e.g., market forces, weather conditions), the fleet may be able to land the entire quota allocation. For the purpose of the analysis of this and the quota alternatives that follow, it will be assumed that the industry would be able to fully harvest 100,000 bushels of ocean quahogs in 2011, 2012, and 2013.

Reducing the Maine ocean quahog quota to 50% of the maximum allowable under the existing management plan represents a 50% reduction in potential landings versus the status quo. However, it is assumed that once the initial quota assigned to the Maine fishery is harvested, Maine fishermen may be expected to rent ocean quahog quota from the ITQ fishery to replace it.

For the purposes of this analysis, it is assumed that the rental price will be $1.00 per bushel. It is further assumed that if the Maine quota were reduced by 50,000 bushels in a given year, that 90% of the reduction would be replaced by rented allocation from the ITQ fishery, or 45,000 Maine bushels. Total landings would then equal 95,000 Maine bushels.

7.3.2.2 Ex-vessel prices

A reduction in the quota available to Maine ocean quahog fishermen will cause them to replace it with rented quota from the ITQ fishery. Rented quota, therefore, will simply become an additional variable cost of harvest operations.

Without knowledge of the elasticities of demand and supply in the fresh, half-shell market, it is difficult to predict changes in ex-vessel prices. However, a 50% reduction in the Maine quota would be a significant event for the Maine fishery, given that more than the 100,000 bushel quota has been recently utilized. The Maine quota would likely be exhausted in mid-year, when most of the Maine vessels are still participating in the fishery. Most of the vessels, therefore, may be expected to rent quota from the ITQ fishery. The additional $1.00 per bushel cost would be minimal considering the much higher value which Maine ocean quahogs command when compared to landings from the ITQ fishery. The average ex-vessel price for Maine ocean quahogs was $32.91 per Maine bushel in 2009, compared with $6.76 per bushel in the ITQ fishery.

It is expected that Maine fishermen would be able to pass along a portion of their increased costs from renting quota, resulting in a small ex-vessel price increase for Maine ocean quahogs.

7.3.2.3 Consumer prices

With ex-vessel prices expected to increase modestly under this alternative, prices to consumers may increase very slightly.

7.3.2.4 Consumer surplus

Assuming that consumers would pay a slightly higher retail price for Maine ocean quahogs, consumer surplus would decrease slightly.

7.3.2.5 Harvest costs

After the initial Maine ocean quahog quota is exhausted, fishermen may be expected to rent quota from the ITQ fishery. The cost per ITQ bushel is estimated at $1.00. Assuming that the 90% of the quota reduction of 50,000 bushels is replaced, the increased harvesting costs would equal $45,000 across all vessels.

7.3.2.6 Producer surplus

It is expected that producers (vessels) will absorb a portion of the increased costs of harvest that would result from renting ITQ quota. Producer surplus would correspondingly decrease slightly.

7.3.2.7 Enforcement costs

With the widespread use of ITQ quota in Maine that this alternative envisions, the costs of tracking and enforcing it would increase.

7.3.2.8 Distributive impacts

There are no changes to the quota allocation process for this species. As such, no distributional effects are identified under this alternative.

7.3.2.9 Cumulative impacts

No significant cumulative impacts are foreseen from adoption of this alternative.

7.3.2.10 Risk of biological overexploitation

The risk of localized overexploitation exists in all of the management alternatives currently available for the Maine ocean quahog fishery. From a coast-wide perspective, there is little risk to the ocean quahog resource from the total allowable harvest of the combined ITQ and Maine ocean quahog quotas.

This alternative estimates that landings would drop by 5,000 Maine bushels in response to the additional expense of renting 45,000 bushels from the ocean quahog ITQ fishery. Hence, the risk of biological overexploitation would be slightly lower than under the status quo, preferred alternative.

7.3.3 Alternative M2 - Slight Decrease of 10% - 90,000 Bu.

This alternative would decrease the quotas for the Maine ocean quahog management zone for 2011, 2012, and 2013 by 10% to 90,000 Maine bushels.

7.3.3.1 Landings

Reducing the Maine ocean quahog quota by 10,000 Maine bushels represents a 10% reduction in potential landings versus the status quo. However, it is again assumed that once the initial quota assigned to the Maine fishery is harvested, fishermen may simply rent ocean quahog quota from the ITQ fishery to replace it. For the purposes of this analysis, it is assumed that 90% of the reduction would be replaced through rentals, or 9,000 Maine bushels. Total landings would then equal 99,000 Maine bushels.

7.3.3.2 Ex-vessel prices

Given that 90% of the quota remains available to the Maine fishery under this alternative, it would likely sustain the fishery through most of the peak summer harvest season. The vessels that would then need to rent additional quota from the ITQ portion of the fishery should represent a substantially smaller number. It is assumed, however that these suppliers (vessels) would attempt to recover a portion of their increased costs of renting ITQ tags for the 9,000 bushels. Hence ex-vessel prices might increase slightly.

7.3.3.3 Consumer prices

Given the expectation that ex-vessel prices will increase slightly under this alternative, it is possible that a small portion of the increase will be passed along to consumers.

7.3.3.4 Consumer surplus

With consumer prices expected to increase very slightly under this alternative, a very small decrease in consumer surplus would result.

7.3.3.5 Harvest costs

It is expected that vessels would respond to a decrease in the Maine quota by renting back 90% of the loss from the ITQ portion of the fishery. This would entail a purchase of cage tags for 9,000 bushels. At an estimated cost of $1.00 per bushel, this would result in an increase of $9,000 in harvest costs across all vessels still participating in the fishery at the end of the year.

7.3.3.6 Producer surplus

It is expected that producers (vessels) will absorb a portion of the increase in costs that would result from renting ITQ quota. Producer surplus would correspondingly decrease very slightly.

7.3.3.7 Enforcement costs

With the need to administer and track the use of additional ITQ quota in the Maine fishery, enforcement costs would increase very slightly.

7.3.3.8 Distributive impacts

There are no changes to the quota allocation process for this species. As such, no distributional effects are identified under this alternative.

7.3.3.9 Cumulative impacts

No significant cumulative impacts are foreseen from adoption of this alternative.

7.3.3.10 Risk of biological overexploitation

This analysis assumes that landings would decline by 1,000 Maine bushels due to the added costs of renting ITQ allocation. Hence, theoretically there would be a very small decrease in the risk of biological overexploitation of the Maine ocean quahog resource relative to the status quo alternative.

7.3.4 Alternative M4 - No Action (Quota Removed)

A 'no action' alternative is evaluated in the EA portion of this document because the National Environmental Policy Act requires that an EA consider all reasonable alternatives, including the preferred action and the 'no action' alternative. While there is no OY range specified in the regulations for the Maine ocean quahog fishery, Amendment 10 set a maximum quota of 100,000 bushels. Removing the quota would violate this maximum quota.

7.3.5 Summary of Maine Ocean Quahog Quota Impacts

Summary of Impacts for Proposed 2011, 2012, and 2013 Maine Ocean Quahog Quota Alternatives Relative to Status Quo Alternative M3: 100,000 Bushels (Preferred).		
Feature	**50,000 Maine bushels** Used by: Alt. M1 For Years: 2011, 2012, 2013 50% of Maximum Quota	**90,000 Maine bushels** Used by Alt. M2 For Years: 2011, 2012, 2013 Slight Decrease of 10%
Landings	-5,000 Maine bu. (assumes 45,000 Maine bushels will be leased from ITQ portion of the fishery)	-1,000 Maine bu. (assumes that 9,000 Maine bushels will be leased from ITQ portion of the fishery)
Ex-vessel Prices	Small +	Slight +
Consumer Prices	Slight +	Very Slight +
Consumer Surplus	Slight -	Very Slight -
Harvest Costs	+ $45,000 (?)	+ $9,000 (?)
Producer Surplus	Slight -	Slight -
Enforcement Costs	+	Slight +
Distributive Impacts	0	0
Cumulative Impacts	0	0
Risk of Biological Overexploitation	Slight -	Very Slight -
+ indicates an increase relative to the status quo; - indicates a decrease relative to the status quo; 0 indicates no change; ? indicates unknown		

7.4 Other Management Actions: Suspend Minimum Size Restriction on Surfclams for 2011, 2012, and 2013

The Atlantic Surfclam and Ocean Quahog FMP includes a provision for a minimum size limit of 4.75 inches on surfclams, which may be used to protect new year classes from harvest before they have reached an optimal size. The provision is written such that a minimum size will automatically be in effect unless the Council takes the active step of suspending it each year.

The current stock is comprised primarily of large, adult individuals, with few small individuals apparent from landings in most areas. Reinstating a minimum size under these conditions may result in greater harm than benefit, as it would require the industry to use "sorting" machines which will often damage undersized clams as it routes them back overboard.

It is, therefore, the Council's recommendation that the surfclam minimum size limit be suspended for 2011, 2012, and 2013, as has been done since 1990. Continuing the suspension will have no impact on the current fishery.

7.4.1 Alternative of Allowing the Surfclam Minimum Size Limit to take Effect in 2011, 2012, and 2013

Each year the Council must take the active step of suspension, or a minimum size of 4.75 inches will automatically go into effect as of January 1. The current regulations read as follows:

> § 648.72 Minimum surfclam size.
>
> (a) Minimum length. The minimum length for surfclams is 4.75 inches (12.065 cm).
>
> (b) Determination of compliance. No more than 50 surfclams in any cage may be less than 4.75 inches (12.065 cm) in length. If more than 50 surfclams in any inspected cage of surfclams are less than 4.75 inches (12.065 cm) in length, all cages landed by the same vessel from the same trip are deemed to be in violation of the minimum size restriction.
>
> c) Suspension. Upon the recommendation of the MAFMC, the Regional Administrator may suspend annually, by publication in the Federal Register, the minimum shell-height standard, unless discard, catch, and survey data indicate that 30% of the surfclams are smaller than 4.75 inches (12.065 cm) and the overall reduced shell height is not attributable to beds where the growth of individual surfclams has been reduced because of density dependent factors.
>
> (d) Measurement. Length is measured at the longest dimension of the surfclam shell.

The minimum size provision for the surfclam fishery is a measure that is most appropriate when a large proportion of the resource is comprised of smaller, younger surfclams. Its application can help ensure the continued viability of a young, or recovering resource by delaying their harvest until they have had multiple opportunities to spawn. It is also intended to improve the overall meat yield from a fishery by postponing harvest until after the rapid growth phase which occurs in the adolescence of most species.

The condition of having a large portion of the resource in an immature state occurred in the surfclam fishery following the anoxia event in the summer of 1976. Low levels of dissolved oxygen in the water off the coast of New Jersey killed large portions of the surfclam resource available at the time. In the subsequent years the Mid-Atlantic Council implemented a series of management measures for surfclams. These included quarterly harvest quotas, a moratorium on new vessels entering the fishery, effort limitations, reporting requirements, closed areas, and an initial minimum size limit of 5.5 inches.

Unfortunately, in addition to the desired effect, each of these measures also produced some negative side effects. Quarterly quotas that were shared among all vessels still motivated a race to fish as vessels sought to harvest as much as possible before the quota was reached and the fishery closed. The vessel moratorium made the replacement of ageing vessels difficult and contentious. Effort limitations which limited the amount of time a vessel could operate were expensive to enforce and costly to vessel owners in the forced down-time of their vessels. Closed nursery areas were very expensive to enforce because they required the use of Coast Guard cutters or surveillance aircraft.

Minimum size limits are also subject to their share of unintended consequences. The minimum size for surfclams was generally favored by processors because it obliged fishermen to bring them the most profitable, high-yielding clams. However, vessel owners were subject to fines if their catches were found to be in violation, and resource benefits are muted when captains are unable to avoid small individuals, and are forced to discard them.

The culling out of small clams is most often accomplished with sorting machines, which will direct clams across a series of parallel metal rollers, allowing the smaller individuals to fall between the rollers and be shunted back overboard. Fracture of the clam shell during this process is common, and a significant portion of the animals returned to the ocean will not survive.

In the 2009 surfclam logbook data, there was only 6.1% of the landings that were smaller than 4.75 inches (Witzig 2009). Numbers of this magnitude are not suggestive of a population dominated by small individuals. Moreover, assessment figures continue to indicate that the stock is comprised primarily of large, adult individuals. Reinstating a minimum size under these conditions would result in greater harm than benefit, because it would result in higher discard mortality through the expanded use of sorters, as vessel owners seek to minimize the risk of fines.

It is, therefore, the Council's recommendation that the surfclam minimum size limit be suspended for 2011, 2012, and 2013, as has been done since 1990. Continuing the suspension will provide substantial benefits through maintaining a low discard mortality rate, while giving up little in the way of increased survival of juveniles.

8.0 INITIAL REGULATORY FLEXIBILITY ANALYSIS - IMPACTS ON SMALL ENTITIES

8.1 Introduction

The purpose of the Regulatory Flexibility Act (RFA - 5 U.S.C. 601 et seq.) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration (NMFS 2007)

An Initial Regulatory Flexibility Analysis (IRFA) is designed to assess the impacts that various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize adverse impacts (NMFS 2007).

In addition to the economic impact analysis, Section 603 (b) of the RFA identifies the elements that should be included in the IRFA. These are as follows:

- A description of the reasons why action by the agency is being considered.
- A succinct statement of the objectives of, and legal basis for, the proposed rule.
- A description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply.

-A description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record.
- An identification, to the extent practicable, of all relevant federal rules, which may duplicate, overlap, or conflict with the proposed rule.

- Each IRFA shall also contain a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of the applicable statutes, the analysis shall discuss significant alternatives such as --

· The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities.

· The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities.

· The use of performance rather than design standards.

· An exemption from coverage of the rule, or any part thereof, for such small entities.

8.2 Reasons Why The Action Is Being Considered

There are only four regulatory actions contemplated in this document:

1) Specifying a maximum harvest limit (quota) for Atlantic surfclams in federal waters for the years 2011, 2012, and 2013.

2) Specifying a maximum harvest limit (quota) for ocean quahogs in federal waters for the years 2011, 2012, and 2013 *outside* the Maine (mahogany) ocean quahog zone.

3) Specifying a maximum harvest limit (quota) for ocean quahogs in the Maine (mahogany) ocean quahog zone for the years 2011, 2012, and 2013.

4) Making a determination as to whether the minimum size limit of 4.75 inches for surfclams should continue to be suspended for 2011, 2012, and 2013.

The proposed actions are critical components of the management program developed for surfclams and ocean quahogs in federal waters, and the Maine (mahogany) ocean quahog zone.

The ITQ system implemented for these fisheries enables much higher net benefits to the nation by removing the incentives for overcapitalization and derby fishing. The privileges to harvest the annual quotas are assigned to allocation holders at the outset of each year, with each receiving a specific number of cage tags that equates to their percentage share of the quota for that year. They are then free to harvest the allocation themselves, or lease it to others if they choose. Market forces will tend to steer these allocations to the best captains and most efficient vessels,

since they will be able to generate the highest profits and hence offer the highest rental prices to allocation owners.

This system could not function without the annual specification of quotas, and is a primary reason for the regulatory action proposed in this document. A second critical function of annual quotas is to prevent overfishing and obtain the optimal yield from a fishery.

8.3 Statement of the Objectives and Legal Basis for the Proposed Rule

A description of the management objectives of the Atlantic Surfclam and Ocean Quahog FMP are presented in the EA section 4.2 "Management Objectives and Management Unit of the FMP" of this document.

Management authority and responsibilities are defined in the Magnuson-Stevens Fishery Conservation and Management Act, Public Law 94-265, as amended by the Magnuson-Stevens Fishery Conservation and Reauthorization Act (Public Law 109-479).

Regulations implementing the Act can be found in the code of federal regulations at:

> Title 50: Wildlife and Fisheries
> PART 648—FISHERIES OF THE NORTHEASTERN UNITED STATES
> Subpart E—Management Measures for the Atlantic Surfclam and Ocean Quahog Fisheries

8.4 Description of Small Entities to Which the Proposed Rule Will Apply

The category of small entities likely to be affected by the proposed actions is that of ITQ holders and fishermen in the commercial Atlantic surfclam and ocean quahog fishery. The impacts of the proposed action on the fishing industry and the economy as a whole were discussed above. The following discussion of impacts centers specifically on the effects of the proposed actions on the mentioned small business entities.

The Small Business Administration (SBA) defines any fish-harvesting or hatchery business as a small business if it is "independently owned and operated and not dominant in its field of operation and if it has total annual gross receipts not in excess of $4.0 million." The Northeast Regional Office of the National Marine Fisheries Service maintains current ownership records of surfclam and ocean quahog allocation holders. The following two tables contain summaries of the 2010 surfclam and ocean quahog initial allocation ownership. These are the entities that will be most directly impacted by the setting of annual quotas.

Allocation ownership is a matter of public record, and a list of the current owners of record may be found at:

> http://www.nero.noaa.gov/sfd/clams/

Note that individual allocations are often registered in the name of a corporation, rather than an individual. It is common for owners of multiple fishing vessels to list each one as being owned by a separate corporation for the purpose of limiting liability. Similarly, a single individual might own multiple allocations that are listed in NMFS' records as being registered to distinct corporations for the same reason. Banks that have loaned money to allocation holders will often

require that the allocation be placed in the bank's name as collateral for the loan. A single individual may have several such loans. Hence it is important to understand that the number of allocations is not equal to the number of allocation owners. The number of owners will be smaller due to the ownership of multiple allocations, which may be listed under a corporate name or in the name of a bank.

Initial 2010 Surfclam Allocations by State.			
No. of Allocations	**State**	**Total Bushels Held**	**Bu/Allocation**
29	NJ	1,507,328	51,977
7	VA	1,041,696	148,814
12	MD	364,576	30,381
9	VAR*	487,424	54,158
Total = 57		**3,401,024**	**59,667**
* Var = CT, MA, NY, RI			

Initial 2010 Ocean Quahog Allocations by State.			
No. of Allocations	**State**	**Total Bushels Held**	**Bu/Allocation**
26	NJ	2,516,544	96,790
7	MD	327,520	46,789
6	VA	1,081,920	180,320
6	VAR*	1,399,296	233,216
Total = 45		**5,325,280**	**118,340**
*Var = CA, ME, NY, RI			

The following table lists the number of vessels active in harvesting surfclams and ocean quahogs in the non-Maine fisheries. Some of these vessels may not hold allocations. Depending on the regulations promulgated, the population affected by the regulation may change, i.e. if, for example, an area is closed, both holders and service providing vessels may be affected, while with a quota change, only holders may appropriately be affected and service providers impacted. In addition, 19 vessels participated in the Maine ocean quahog fishery in 2009. All of these vessels readily fall within the definition of small businesses.

Vessel Participation in the 2009 Surfclam and non-Maine Ocean Quahog Fisheries.	
Species Harvested	**Number of Vessels**
Surfclams only	28

Ocean Quahogs only	7
BOTH Surfclams and Ocean Quahogs	8
TOTAL	**43**

8.5 Description of Reporting and Record-Keeping Requirements

There are no reporting or record-keeping requirements associated with the four proposed actions discussed in this document. They relate solely to maximum harvest levels for surfclams and ocean quahogs in federal waters and the Maine (mahogany) ocean quahog zone, and to whether the minimum size limit for surfclams should continue to be suspended.

Proposed and final rules on these actions will be published in the Federal Register. Public comment is welcomed and encouraged, both in written format and through verbal testimony at Council meetings, however none is required.

8.6 Identification of Other Federal Rules That May Duplicate, Overlap, or Conflict with the Proposed Rule

The Mid-Atlantic Fishery Management Council and National Marine Fisheries Service have the sole authority to regulate fishing quotas for surfclams and ocean quahogs in federal waters, thus these quota specifications do not overlap with any other proposed rule.

8.7 Description of Alternatives to the Proposed Rule That Achieve Objectives Yet Minimize Impacts on Small Entities

8.7.1 Consider The Establishment of Differing Compliance or Reporting Requirements or Timetables That Take Into Account the Resources Available to Small Entities

There are no reporting or record-keeping requirements proposed within this suite of regulatory actions.

Complying with annual quota specifications does not impose any direct costs on industry. Rather they represent a cap or upper limit on harvest operations.

Failing to suspend the minimum size limit on surfclams, however, would impose compliance costs on the industry and enforcement costs on the government and taxpayers. The surfclam minimum size limit has been suspended each year since 1990. Prior to that point in time, vessels installed sorting machinery in order to route smaller individuals back overboard. The requirement produced the undesirable side effects of increasing the costs of vessel operation and additional mortality of those small individuals that were returned to the ocean with cracked shells and eventually died.

Given that most surfclams being harvested today are above the minimum size, this provision would likely result in greater harm than good, and is not recommended by the Council.

8.7.2 Consider The Clarification, Consolidation, or Simplification of Compliance and Reporting Requirements Under the Rule for Small Entities

There are no reporting or record-keeping requirements proposed within this suite of regulatory actions.

As stated previously, complying with annual quota specifications does not impose any direct costs on industry. Rather they represent a cap or upper limit on harvest operations.

8.7.3 Consider The Use of Performance Rather than Design Standards

The ITQ management program implemented in the surfclam and ocean quahog fisheries embodies the use of performance rather than design standards. Harvests are limited to sustainable levels directly and efficiently through individual transferrable quotas, rather than indirectly and inefficiently through effort and gear restrictions.

The Maine ocean quahog fishery is currently managed through a 'hybrid' system of an annual quota for the Maine (mahogany) ocean quahog zone and inflows of ITQ quota that can be rented or purchased from the industrial portion of the fishery.

Converting the Maine management program to a complete ITQ system is up for consideration in future amendments to the FMP.

8.7.4 Consider Exempting Small Entities From All or Part of the Rule

Exemptions from quota management systems tend to be problematic. They would engender resentment from those participants in a fishery that must adhere to a stricter set of rules.

8.8 Analysis of the Impacts of Alternatives

8.8.1 Impacts on the Recreational Sector of All Alternatives

Atlantic surfclams and ocean quahogs are harvested exclusively by the commercial entities. None of the proposed alternatives will have any impact on the recreational sector.

8.8.2 Impacts of the Surfclam Quota Alternatives

The impacts of adjustments to the federal quota for surfclams on small businesses is exceptionally straightforward to assess. Both the surfclam and ocean quahog fisheries are single-species fisheries, with almost no bycatch of other commercially-valuable or protected species. Vessels are able to effectively target each species individually, without the risk of needing permits for other species, or running afoul of closed seasons or minimum sizes.

The direct impacts of any quota adjustment would be felt by the 57 entities currently holding surfclam ITQ allocations. The actual number of individuals or businesses holding the 57 registered allocations will be smaller, since each holder will often maintain multiple allocations for accounting, or liability purposes.

8.8.2.1 Preferred Alternative S3 - status quo surfclam quota - 3.400 million bu.
The recommended surfclam quotas for 2011, 2012, and 2013 are to maintain the status quo at 3.400 million bushels. Hence, adoption of the preferred alternative would have no impact on entities participating in the fishery.

There are no other associated impacts on small entities. Reporting costs and compliance costs would not change as a result of the proposed action.

8.8.2.2 NON-PREFERRED Alternative S1 - 45.6% decrease in surfclam quota - 1.850 Million Bu.

A 45.6% decrease in the federal surfclam quota would subtract 27,208 bushels from the current average allocation of 59,667 bushels. At an average ex-vessel value of $11.97 per bushel, the gross value of the quota decrease would equal $325,680 per allocation.

For those entities that are simply renting their allocation, it is assumed that the current rental value for a bushel of surfclams is $4.00. The foregone value of 27,147 bushels would equate to $108,588.

Such a large reduction in the quota would have a major impact on small entities, and is not recommended by the Council. In addition, given the current biological status of the stock, the Council does not believe a quota reduction is warranted at this time, and hence this alternative is not recommended for adoption.

8.8.2.3 NON-PREFERRED Alternative S2 - 4.4% decrease in surfclam quota - 3.250 million bu.

A 4.4% decrease in the federal surfclam quota would subtract 2,625 bushels from the current average allocation of 59,667 bushels. At an average ex-vessel value of $11.97 per bushel, the gross value of the quota decrease would equal $31,421 per allocation.

For those allocation owners renting their allocation, 2,625 bushels at $4.00 per bushel equates to a loss of $10,500.

Given the current biological status of the stock, the Council does not believe a quota reduction is warranted at this time, and hence this alternative is not recommended for adoption.

8.8.2.4 NON-PREFERRED Alternative S4 - no action (surfclam quota removed)

A 'no action' alternative is evaluated in the EA portion of this document because the National Environmental Policy Act requires that an EA consider all reasonable alternatives, including the preferred action and the 'no action' alternative.

The Mid-Atlantic Council is required by 50 CFR part 648 to recommend annual quotas that fall within the optimum yield range for each species. Failure to make a recommendation within these bounds is not a legal option, and would be inconsistent with National Standard 1 of the Magnuson-Stevens Act. Hence the 'no action' alternative will not be considered further in this section.

8.8.3 Impacts of the Ocean Quahog ITQ Quota Alternatives

Direct impacts of quota adjustments will be felt by the 45 entities currently holding ocean quahog ITQ allocations.

8.8.3.1 Preferred Alternative Q3 - status quo ocean quahog quota - 5.333 million bu.

As described in other sections, near-term industry harvests are not likely to approach the optimum yield range of 4.000 to 6.000 million bushels which the Council must legally use when recommending annual quotas for the federal ocean quahog fishery. As a practical matter, the only impact the federal quota has on the industry is to determine the relative size of the quota surplus. Indirectly, this will impact the distribution of who will be able to sell their allocation, and at what price. If the surplus is zero, then 100% of the allocation owners will be able to sell 100% of their tags, and rental values will be higher. If the surplus is large, then rental values will be driven down, and those allocation owners that are willing to accept a lower price will likely be able to market more of their tags. Companies that would normally have to purchase allocation from others will benefit from lower rental prices, and if they own allocation, higher quotas will translate into more bushels that they will receive with their own percentage share, and hence they will need to rent or buy fewer bushels from others.

It is possible that having large quota surpluses over a period of time will result in consolidation, as owners who fail to find a market for their quota are ultimately likely to sell.

For the purposes of this analysis, it is assumed that industry will not harvest more than 4.000 million bushels of ocean quahogs in 2011, 2012, or 2013. In maintaining a quota of 5.333 million bushels, this would result in a surplus of 1.333 million bushels each year. It is further assumed that a surplus of this magnitude will depress ocean quahog rental values to approximately $0.53 per bushel. The unsold quota would then represent a loss in rental income of $706,490.

8.8.3.2 NON-PREFERRED Alternative Q1 - 20% decrease in ocean quahog quota - 4.000 million bu.

It is assumed that a 20.0% decrease in the federal ocean quahog quota to 4.000 million bushels would result in little surplus quota, such that rental values for ocean quahog allocation would remain in the neighborhood of $1.00 per bushel.

8.8.3.3 NON-PREFERRED Alternative Q2 - 6.2% decrease in ocean quahog quota - 5.000 million bu.

It is estimated that decreasing the federal ocean quahog quota to 5.000 million bushels would result in a surplus of approximately 1.000 million bushels, and that rental values for ocean quahog allocation would fall to the vicinity of $0.65 per bushel.

8.8.3.4 NON-PREFERRED Alternative Q4 - 20% increase to maximum ocean quahog quota - 6.000 million bu.

This alternative would raise the ocean quahog quota to the maximum allowable level of 6.000 million bushels for 2011, 2012, and 2013. It can be expected to create a massive surplus of

approximately 2.0 million bushels, and drive down the rental value of ocean quahog allocation to the neighborhood of $0.30 per bushel. It is likely that some allocation owners with lesser access to a market would be likely to permanently sell their allocations at discounted prices, and may result in greater consolidation and less competition in the market.

8.8.3.5 NON-PREFERRED Alternative Q5 - no action (ocean quahog quota removed)

A 'no action' alternative is evaluated in the EA portion of this document because the National Environmental Policy Act requires that an EA consider all reasonable alternatives, including the preferred action and the 'no action' alternative.

The Mid-Atlantic Council is required by 50 CFR part 648 to recommend annual quotas that fall within the optimum yield range for each species. Failure to make a recommendation within these bounds is not a legal option, and would be inconsistent with National Standard 1 of the Magnuson-Stevens Act. Hence the 'no action' alternative will not be considered further in this section.

8.8.4 Impacts of the Maine Ocean Quahog Quota Alternatives

The Maine ocean quahog fishery is currently prosecuted by a total of 19 small vessels. The annual quota pertains to the Maine ocean quahog zone, and is not allocated to individual allocation holders as is the case outside of Maine. Once the Maine quota is harvested, fishing may only proceed if quota is rented from the ITQ fishery outside of Maine.

8.8.4.1 Preferred Alternative M3 - status quo Maine ocean quahog quota - 100,000 bu.

Maintaining the current Maine ocean quahog quota of 100,000 Maine bushels would result in no change when compared to 2010. Hence, the preferred alternative would have no impact on revenues, compliance costs, or reporting costs for small entities.

8.8.4.2 NON-PREFERRED Alternative M1 - 50% decrease in Maine ocean quahog quota - 50,000 bu.

In 2009, a total of 19 vessels participated in the Maine ocean quahog fishery. It is assumed that if the Maine quota were reduced by 50% to 50,000 Maine bushels, 90% of the reduction would be replaced by renting allocation from the ITQ fishery. This would equal a total of 45,000 bushels rented, at an estimated $1.00 per bushel. Divided amongst the 19 active vessels in the fleet, the average cost per vessel would equal $2,368.

8.8.4.3 NON-PREFERRED Alternative M2 - slight decrease in Maine ocean quahog quota by 10% -- 90,000 bu.

This alternative would set the 2011, 2012, and 2013 quotas for Maine ocean quahogs to 90,000 Maine bushels. It is assumed that if the Maine quota were reduced to 90,000 Maine bushels, 90% of the reduction would be replaced by renting allocation from the ITQ fishery. This would equal a total of 9,000 bushels rented, at an estimated $1.00 per bushel. Divided amongst the 19 active vessels in the fleet, the average cost per vessel would equal $473.

8.8.4.4 NON-PREFERRED Alternative M4 - no action (Maine ocean quahog quota removed)

A 'no action' alternative is evaluated in the EA portion of this document because the National Environmental Policy Act requires that an EA consider all reasonable alternatives, including the preferred action and the 'no action' alternative.

The Mid-Atlantic Council is required by 50 CFR part 648 to recommend annual quotas that fall between 17 and 100 thousand bushels. Failure to make a recommendation within these bounds is not a legal option, and would be inconsistent with National Standard 1 of the Magnuson-Stevens Act. Hence the 'no action' alternative will not be considered further in this section.

8.8.5 Impacts of the Suspending the Surfclam Minimum Size Limit Alternatives

8.8.5.1 Preferred Alternative - status quo - maintain surfclam size limit suspension in 2011, 2012, and 2013

Maintaining the suspension of the surfclam minimum size limit would result in no change when compared to 2010. Hence, the preferred alternative would have no impact on revenues, compliance costs, or reporting costs for small entities.

8.8.5.2 NON-PREFERRED Alternative - allow surfclam size limit to take effect in 2011, 2012, and 2013

The current stock is comprised primarily of large, adult individuals, with few small individuals apparent from landings in most areas. Reinstating a minimum size under these conditions would result in greater harm than benefit, as it would require the industry to use "sorting" machines which will often damage undersized clams as it routes them back overboard.

It is expected that adopting this alternative would result in substantial costs to small business entities, without producing a significant compensating benefit to the surfclam resource. Hence, the Mid-Atlantic Council does not recommend adoption of this alternative.

9.0 REFERENCES

Mid-Atlantic Fishery Management Council (MAFMC). 1988. Amendment #8 to the Atlantic surfclam and ocean quahog fishery management plan. Dover, DE.

_____. 1998. Amendment #10 to the Atlantic surfclam and ocean quahog fishery management plan. Dover, DE.
_____. 2003. Amendment #13 to the Atlantic surfclam and ocean quahog fishery management plan. Dover, DE.

National Marine Fisheries Service (NMFS). 2007. Guidelines for economic analysis of fishery management actions, (Revised). Silver Spring, MD.

U.S. Department of Commerce (USDC). 2009a. 48th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc. 09-09.

_____. 2009b. 49th Northeast Regional Stock Assessment Workshop. NEFSC Ref. Doc. 10-01.
Witzig, J. 2009. Analysis of the proportion of undersized surfclams in coastwide landings for 2009. NERO. 6 pages.

Appendix Table 1. Surfclam Fishery in the EEZ: Number of Vessels, Trips, Hours at Sea, Hours Fishing, Landings (Bushels), Landings per Unit Effort (bu/hour fishing), and Average Landings per Vessel.

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Surfclam Landings	LPUE*	Ave. Bu. per Boat
1979	1	26	584	9,080	5,787	103,665	17	3,987
	2	61	1,992	39,369	22,670	484,151	21	7,937
	3	75	2,622	59,298	34,326	1,086,393	32	14,485
	All	162	5,198	107,747	62,783	1,674,209	26	10,335
1980	1	14	406	5,674	3,650	79,621	19	5,687
	2	54	2,164	38,743	23,996	597,646	24	11,068
	3	59	2,323	53,098	31,153	1,246,766	40	21,132
	All	127	4,893	97,515	58,799	1,924,033	32	15,150
1981	1	16	328	4,701	2,927	64,942	22	4,059
	2	48	1,502	25,029	14,507	572,063	37	11,918
	3	59	2,198	47,664	23,555	1,339,433	56	22,702
	All	123	4,028	77,394	40,989	1,976,438	47	16,069
1982	1	15	511	7,535	4,908	97,833	20	6,522
	2	47	2,037	32,906	20,916	614,069	28	13,065
	3	53	2,734	55,855	29,721	1,290,928	42	24,357
	All	115	5,282	96,296	55,545	2,002,830	35	17,416
1983	1	14	408	6,323	4,025	113,753	28	8,125
	2	48	2,035	30,354	19,302	818,966	40	17,062
	3	55	2,341	48,934	25,279	1,479,221	58	26,895
	All	117	4,784	85,611	48,606	2,411,940	48	20,615
1984	1	15	319	4,897	3,142	126,421	40	8,428
	2	50	1,763	27,341	16,755	1,152,763	66	23,055
	3	54	1,638	34,893	16,499	1,687,842	96	31,256
	All	119	3,720	67,131	36,396	2,967,026	77	24,933
1985	1	13	217	2,075	1,089	87,791	78	6,753
	2	49	1,307	15,986	7,415	962,313	122	19,639
	3	68	1,582	32,533	11,840	1,859,226	149	27,342
	All	130	3,106	50,594	20,344	2,909,330	135	22,379
1986	1	13	164	1,986	984	81,895	83	6,300
	2	54	1,037	14,679	6,094	964,583	143	17,863
	3	77	1,540	34,724	10,676	2,134,164	189	27,716
	All	144	2,741	51,389	17,754	3,180,642	167	22,088
1987	1	11	159	2,709	1,234	68,006	55	6,182
	2	54	1,143	17,432	7,771	923,127	113	17,095
	3	77	1,433	31,303	8,840	1,828,686	199	23,749
	All	142	2,735	51,444	17,845	2,819,819	151	19,858
1988	1	10	207	3,466	1,895	93,740	49	9,374
	2	51	1,304	19,392	8,743	1,023,364	106	20,066
	3	73	1,527	33,221	9,487	1,914,577	196	26,227
	All	134	3,038	56,079	20,125	3,031,681	143	22,624

(Continued next page)

Appendix Table 1. (continued)

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Surfclam Landings	LPUE*	Ave Bu/Boat
1989	1	9	185	3,148	1,904	87,151	44	9,683
	2	50	1,186	15,481	7,357	947,092	117	18,942
	3	76	1,508	26,324	9,610	1,804,165	182	23,739
	All	135	2,879	44,953	18,871	2,838,408	143	21,025
1990	1	8	237	3,931	2,470	69,376	28	8,672
	2	45	1,086	12,450	6,233	961,195	138	21,360
	3	75	1,636	25,067	11,043	2,083,405	184	27,779
	All	128	2,959	41,448	19,746	3,113,976	150	24,328
1991	1&2	25	971	13,853	6,300	808,893	120	32,356
	3	50	1,470	24,942	12,765	1,864,520	144	37,290
	All	75	2,441	38,795	19,065	2,673,413	136	35,646
1992	1&2	19	834	10,682	4,873	738,640	142	38,876
	3	40	1,747	29,874	17,521	2,073,630	117	51,841
	All	59	2,581	40,556	22,394	2,812,270	123	47,666
1993	1&2	17	770	9,294	4,713	778,766	164	45,810
	3	36	1,697	28,538	16,333	2,055,951	126	57,110
	All	53	2,467	37,832	21,046	2,834,717	134	53,485
1994	1&2	15	808	9,778	5,597	826,366	148	55,091
	3	32	1,668	30,844	17,980	2,020,304	112	63,135
	All	47	2,476	40,622	23,577	2,846,670	121	60,567
1995	1&2	13	793	10,800	5,739	810,125	141	62,317
	3	24	1,453	26,169	15,622	1,735,180	111	72,299
	All	37	2,246	36,969	21,361	2,545,305	119	68,792
1996	1&2	12	892	12,821	7,482	958,937	128	79,911
	3	22	1,286	24,570	15,551	1,610,382	104	73,199
	All	34	2,178	37,391	23,033	2,569,319	112	75,568
1997	1&2	11	803	11,509	6,509	837,198	129	76,109
	3	22	1,316	24,643	15,220	1,576,377	104	71,654
	All	33	2,119	36,152	21,729	2,413,575	111	73,139
1998	1&2	11	736	10,558	5,633	764,551	136	69,505
	3	20	1,340	24,810	15,390	1,600,823	104	80,041
	All	31	2,076	35,368	21,023	2,365,374	113	76,302
1999	1&2	10	671	9,857	4,737	766,833	162	76,683
	3	23	1,484	26,019	15,214	1,771,046	116	77,002
	All	33	2,155	35,876	19,951	2,537,879	127	76,905
2000	1	3	57	979	392	15,869	40	5,290
	2	8	743	11,845	6,155	985,248	160	123,156
	3	20	1,241	21,755	13,360	1,559,904	117	77,995
	All	31	2,041	34,579	19,907	2,561,021	129	82,614

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Appendix Table 1. (continued)

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Surfclam Landings	LPUE*	Ave Bu/Boat
2001	1&2	10	806	12,756	7,181	1,005,617	140	100,562
	3	25	1,584	28,233	17,694	1,849,549	105	73,982
	All	35	2,390	40,989	24,875	2,855,166	115	81,576
2002	1&2	9	850	14,782	8,813	1,055,835	120	117,315
	3	30	1,742	32,349	20,791	2,057,241	99	68,575
	All	39	2,592	47,131	29,604	3,113,076	105	79,822
2003	1&2	7	822	16,465	10,561	1,019,904	97	145,701
	3	27	1,721	36,664	22,962	2,224,344	97	82,383
	All	34	2,543	53,129	33,523	3,244,248	97	95,419
2004	1&2	8	631	15,100	9,105	773,472	85	96,684
	3	27	1,678	41,259	26,220	2,364,384	90	87,570
	All	35	2,309	56,359	35,325	3,137,856	89	89,653
2005	1&2	7	514	11,779	7,674	585,088	76	83,584
	3	29	1,389	38,549	25,435	2,159,304	85	74,459
	All	36	1,903	50,328	33,109	2,744,392	83	76,233
2006	1&2	8	518	13,806	9,827	617,824	63	77,228
	3	21	1,326	41,756	29,659	2,439,100	82	116,148
	All	29	1,844	55,562	39,486	3,056,924	77	105,411
2007	1&2	10	695	19,064	13,726	814,080	59	81,408
	3	23	1,459	48,125	35,971	2,411,808	67	104,861
	All	33	2,154	67,189	49,697	3,225,888	65	97,754
2008	1&2	11	690	19,674	14,784	733,786	50	66,708
	3	21	1,386	48,116	36,564	2,180,640	60	103,840
	All	32	2,076	67,790	51,348	2,914,426	57	91,076
2009	1&2	11	714	21,803	15,485	722,817	47	65,711
	3	25	1,228	45,774	34,420	1,871,329	54	74,853
	All	36	1,942	67,577	49,905	2,594,146	52	72,060

* LPUE values are computed from only those trips which have both Hours Fished and Landings data reported. The Hours Fished and Landings values displayed in this table are gross reported totals, and hence may not be divided to calculate LPUE. Hours Fished values are thought to be under-reported in the Northern New Jersey region between 1986 and 1990, due to strict limits on surfclam fishing time in the management regime prior to Amendment #8.
Source: NMFS Clam Vessel Logbook Files.

Appendix Table 2. Ocean Quahog Fishery in the EEZ: Number of Vessels, Trips, Hours at Sea, Hours Fishing, Landings (Bushels), Landings per Unit Effort (bu/hour fishing), and Average Landings per Vessel.

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Quahog Landings	LPUE*	Ave Bu. per Boat
1979	1 & 2	22	735	10,325	4,333	477,346	109	21,698
	3	37	1,966	35,635	19,545	2,557,350	127	69,118
	All	59	2,701	45,960	23,878	3,034,696	124	51,436
1980	1 & 2	19	561	7,836	3,528	354,110	95	18,637
	3	33	1,950	39,488	22,025	2,607,679	114	79,021
	All	52	2,511	47,324	25,553	2,961,789	111	56,957
1981	1 & 2	12	399	5,965	2,793	248,498	88	20,708
	3	35	2,011	37,914	20,859	2,639,789	125	75,423
	All	47	2,410	43,879	23,652	2,888,287	121	61,453
1982	1 & 2	12	274	4,414	2,391	187,447	77	15,621
	3	31	2,146	39,956	21,515	3,053,328	136	98,494
	All	43	2,420	44,370	23,906	3,240,775	130	75,367
1983	1 & 2	8	225	3,561	1,936	159,214	81	19,902
	3	29	2,243	40,718	21,072	3,056,426	142	105,394
	All	37	2,468	44,279	23,008	3,215,640	137	86,909
1984	1 & 2	16	467	7,266	3,873	369,529	92	23,096
	3	41	2,738	51,563	26,845	3,593,438	129	87,645
	All	57	3,205	58,829	30,718	3,962,967	124	69,526
1985	1 & 2	17	611	9,352	4,756	483,004	99	28,412
	3	47	3,101	58,462	28,988	4,086,505	138	86,947
	All	64	3,712	67,814	33,744	4,569,509	133	71,399
1986	1 & 2	16	471	8,795	4,159	441,192	103	27,575
	3	56	2,714	51,648	25,292	3,726,013	146	66,536
	All	72	3,185	60,443	29,451	4,167,205	140	57,878
1987	1 & 2	16	333	7,359	3,405	359,042	105	22,440
	3	55	2,995	59,220	29,482	4,383,983	146	79,709
	All	71	3,328	66,579	32,887	4,743,025	142	66,803
1988	1 & 2	11	221	4,555	2,088	251,674	114	22,879
	3	51	2,818	60,554	31,213	4,217,699	133	82,700
	All	62	3,039	65,109	33,301	4,469,373	132	72,087
1989	1 & 2	13	540	9,823	4,945	650,059	124	50,005
	3	56	3,055	66,364	34,671	4,280,221	121	76,433
	All	69	3,595	76,187	39,616	4,930,280	122	71,453
1990	1 & 2	14	496	11,002	6,470	623,346	96	44,525
	3	42	2,753	62,569	34,614	3,999,071	115	95,216
	All	56	3,249	73,571	41,084	4,622,417	112	82,543
1991 - Excludes Maine Fishery								
	1&2	11	545	11,889	6,343	731,634	115	66,512
	3	38	2,824	68,002	39,531	4,108,190	103	108,110
	All	49	3,369	79,911	45,874	4,839,824	104	98,772

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Appendix Table 2. Continued

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Quahog Landings	LPUE*	Ave. Bu. per Boat
1992 - Excludes Maine Fishery								
	1&2	9	527	11,267	5,464	693,971	127	77,108
	3	34	2,563	61,914	31,678	4,244,729	132	124,845
	All	43	3,090	73,181	37,142	4,938,700	131	114,853
1993 - Excludes Maine Fishery								
	1&2	8	535	12,764	6,442	720,702	112	90,088
	3	28	2,655	67,549	38,860	4,091,239	105	146,116
	All	36	3,190	80,313	45,302	4,811,941	106	133,665
1994 - Excludes Maine Fishery								
	1&2	7	444	10,748	5,580	580,198	104	82,885
	3	29	2,683	65,734	38,764	4,031,197	104	139,007
	All	36	3,127	76,482	44,344	4,611,395	104	128,094
1995 - Excludes Maine Fishery								
	1&2	6	480	12,168	7,116	692,491	97	115,415
	3	30	2,496	60,216	32,752	3,935,832	120	131,194
	All	36	2,976	72,384	39,868	4,628,323	116	128,565
1996 - Excludes Maine Fishery								
	1&2	5	429	11,439	6,026	678,804	113	135,761
	3	31	2,116	52,328	27,104	3,712,624	137	119,762
	All	36	2,545	63,767	33,130	4,391,428	133	121,984
1997 - Excludes Maine Fishery								
	1&2	6	413	12,570	6,860	684,684	100	114,114
	3	25	1,881	52,535	27,154	3,594,375	132	143,775
	All	31	2,294	65,105	34,014	4,279,059	126	138,034
1998 - Excludes Maine Fishery								
	1&2	5	375	11,491	6,371	587,228	92	117,446
	3	19	1,582	49,236	25,331	3,310,259	131	174,224
	All	24	1,957	60,727	31,702	3,897,487	123	162,395
1999 - Excludes Maine Fishery								
	1&2	5	382	10,817	5,952	559,200	94	111,840
	3	18	1,696	50,612	25,748	3,211,088	125	178,394
	All	23	2,078	61,429	31,700	3,770,288	119	163,926
2000 - Excludes Maine Fishery								
	1&2	6	270	7,933	4,330	429,686	99	71,614
	3	23	1,541	48,369	24,110	2,730,963	113	118,738
	All	29	1,811	56,302	28,440	3,160,649	111	108,988
2001 - Excludes Maine Fishery								
	1&2	6	454	13,588	7,183	778,469	108	129,745
	3	24	1,654	51,637	26,702	2,912,538	109	121,356
	All	30	2,108	65,225	33,885	3,691,007	109	123,034
2002 - Excludes Maine Fishery								
	1&2	6	428	12,589	6,644	712,243	107	118,707
	3	25	1,559	49,424	23,979	3,158,407	132	126,336
	All	31	1,987	62,013	30,623	3,870,650	126	124,860

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Appendix Table 2. Continued

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Quahog Landings	LPUE*	Ave. Bu. per Boat
2003 - Excludes Maine Fishery								
	1&2	6	472	15,132	8,633	801,440	93	133,573
	3	21	1,469	50,793	25,717	3,267,308	127	155,586
	All	27	1,941	65,925	34,350	4,068,748	118	150,694
2004 - Excludes Maine Fishery								
	1&2	6	380	12,100	7,070	633,888	90	105,648
	3	23	1,386	48,888	24,659	3,189,600	129	138,678
	All	29	1,766	60,988	31,729	3,823,488	121	131,844
2005 - Excludes Maine Fishery								
	1&2	5	149	4,521	2,076	170,752	82	34,150
	3	19	1,061	36,508	19,959	2,768,864	139	145,730
	All	24	1,210	41,029	22,035	2,939,616	133	122,484
2006 - Excludes Maine Fishery								
	1&2	4	206	5,316	2,338	283,072	121	70,768
	3	14	974	34,339	18,798	2,783,264	148	198,805
	All	18	1,180	39,655	21,136	3,066,336	145	170,352
2007 - Excludes Maine Fishery								
	1&2	4	215	6,124	3,266	312,672	96	78,168
	3	13	1,057	38,656	20,786	3,053,120	147	234,855
	All	17	1,272	44,780	24,052	3,365,792	140	197,988
2008 - Excludes Maine Fishery								
	1&2	3	85	2,659	1,493	148,576	100	49,525
	3	15	1,108	40,752	23,485	3,225,088	137	215,006
	All	18	1,193	43,411	24,978	3,373,664	135	187,426
2009 - Excludes Maine Fishery								
	All	15	1,124	41,445	24,426	3,433,869	141	228,925

Maine Ocean Quahog Fishery

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Quahog Landings	LPUE*	Ave. Bu. per Boat
1991	All	45	2,221	23,465	17,162	36,679	2.0	815
1992	All	53	1,677	17,711	13,469	24,839	1.8	469
1993	All	33	685	9,732	5,748	17,144	3.0	520
1994	All	30	792	7,189	5,102	21,480	4.2	716
1995	All	30	1,052	8,233	5,747	37,912	6.6	1,264
1996	All	25	1,374	11,811	8,483	47,025	5.5	1,881
1997	All	34	1,945	16,285	11,829	72,706	6.1	2,138
1998	All	39	1,820	18,452	11,777	72,466	6.2	1,858

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Appendix Table 2. Continued

Year	Class	Vessels	Trips	Hours at Sea	Hours Fishing	Quahog Landings	LPUE*	Ave. Bu. per Boat
1999	All	38	1,998	16,188	11,455	93,938	8.2	2,472
2000	All	34	2,197	18,015	12,739	120,767	9.5	3,552
2001	All	31	2,040	18,250	13,350	108,500	8.1	3,500
2002	All	35	2,604	23,724	16,967	128,574	7.6	3,674
2003	All	35	2,674	24,383	17,853	119,675	6.7	3,419
2004	All	34	2,568	25,777	19,022	102,187	5.4	3,006
2005	All	32	2,306	22,794	17,063	100,115	5.9	3,129
2006	All	25	2,177	20,202	14,902	121,373	8.1	4,855
2007	All	24	1,930	18,768	14,018	102,006	7.3	4,250
2008	All	22	1,371	14,251	10,795	66,946	6.2	3,043
2009	All	19	1,237	12,838	9,705	55,649	5.7	2,929

NOTE 1: This table includes ocean quahog landings records from the Clam logbooks ONLY, and does NOT include landings submitted in the Multispecies logbooks until 1998.

NOTE 2. The bushel unit used in the Maine fishery measures 1.2445 cubic feet. The standard bushel unit used in the industrial ITQ fishery outside Maine is 1.88 cubic feet.

* LPUE values are computed from only those trips which have both Hours Fished and Landings data reported. The Hours Fished and Landings values displayed in this table are gross reported totals, and hence may not be divided to calculate LPUE.

Source: NMFS Clam Vessel Logbook Files.